NASA SP-7039(09)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1976

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(09) NASA Patent Abstracts Bibliography (Sect. 1 • Abstracts) JULY 1976

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701—N73-33931
NASA SP-7039(05)	N74-10001—N74-21629
NASA SP-7039(06)	N74-21630—N74-35363
NASA SP-7039(07)	N75-10001—N75-21218
NASA SP-7039(08)	N75-21219—N75-34001
NASA SP-7039(09)	N76-10001—N76-22149

This bibliography was prepared by the NASA Scientific and Technical Information Facility operated for the National Aeronautics and Space Administration by Informatics Information Systems Company.

NASA SP-7039(09)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1976 and June 1976.

Scientific and Technical Information Office JULY 1976
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

This Supplement is available from the National Technical Information Service (NTIS), Springfield, Virginia 22161, for $3.00. For copies mailed to addresses outside the United States, add $2.50 per copy for handling and postage.

INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since May 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Section of Issue 04 (January 1974), the Abstract Section for all subsequent issues, and the Index Section for the most recent issue.

The 200 citations published in this issue of the Abstract Section cover the period January 1976 through June 1976. The Index Section contains references to the 2994 citations covering the period May 1969 through June 1976.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name

Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract as depicted in the Typical Citation and Abstract reproduced below and are also used in the several indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N76-18131*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SOURCE

TITLE

NOISE SUPPRESSOR FOR TURBO FAN JET ENGINES

Patent Application

INVENTOR

Dah Yu Cheng, inventor (to NASA) (Santa Clara Univ.) Filed 13 Feb. 1976 17 p Sponsored by NASA

US PATENT APPLICATIONS SERIAL NUMBER

NASA CASE NUMBER

(NASA-Case-ARC-10812-1; US-Patent-Appl-SN-657903) Avail: NTIS HC $3.50 CSCL 21E

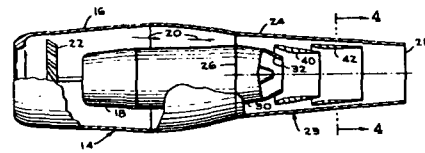
AVAILABILITY

ABSTRACT

A noise suppressor for installation on the discharge or aft end of a turbofan engine is described. Within the suppressor are fixed annular airfoils which are positioned to reduce the relative velocity between the high temperature fast moving jet exhaust and the low temperature slow moving air. Within the suppressor nacelle is an exhaust jet nozzle which constrains the shape of the jet exhaust to a substantially uniform elongate shape irrespective of the power setting of the engine. Fixed ring airfoils within the suppressor nacelle have the same salutary effects irrespective of the power setting at which the engine is operated.

NASA

COSATI CODE



KEY ILLUSTRATION

INDEX SECTION(SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions.

Each of the five indexes utilizes basic data elements: (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the NASA Accession Number.

Accession Number Index: Lists all inventions in order of ascending NASA Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible when using the flexibility incorporated into the *NASA PAB*.

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB*, select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder. For previous *NASA PAB* issues, the Tables of Contents to Section 2 should be examined as the Subject categories were changed beginning with *NASA PAB (07)*.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (does not include applications for patent) within a desired Patent Office Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated inventions(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent Office, Washington, D.C. 20231, for fifty cents a copy.

Copies of pending NASA applications for patent abstracted in *NASA PAB* are sold by the National Technical Information Service, Springfield, Virginia 22161, at the price shown in the citation. Microfiche are sold at the established unit price of $2.25. When ordering copies of an application for patent from NTIS, the U.S. Patent Application Serial Number listed in the index or shown in the citation for each abstract should be used to identify the desired application for patent.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB*, are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB*.

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table. Formal application of license must be submitted on the NASA Form, Application for NASA Patent License, which is available upon request from any NASA Patent Counsel.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAC-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)982-2351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: AA-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 456 Langley Station Hampton, Virginia 23365 Telephone: (804)827-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-311 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AM Houston, Texas 77058 Telephone: (713)483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-601 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

Title 14—AERONAUTICS AND SPACE

Chapter V—National Aeronautics and Space Administration

PART 1245—PATENTS

Subpart 2—Patent Licensing Regulations

1. Subpart 2 is revised in its entirety as follows:

Sec.

AUTHORITY: The provisions of this Subpart 2 issued under 42 U.S.C. 2457, 2473(b)(3).

§ 1245.200 Scope of subpart.

This Subpart 2 prescribes the terms, conditions, and procedures for licensing inventions covered by U.S. patents and patent applications for which the Administrator of the National Aeronautics and Space Administration holds title on behalf of the United States.

§ 1245.201 Definitions.

For the purpose of this subpart, the following definitions apply:

(a) "Invention" means an invention covered by a U.S. patent or patent application for which the Administrator of NASA holds title on behalf of the United States and which is designated by the Administration as appropriate for the grant of license(s) in accordance with this subpart.

(b) "To practice an invention" means to make or have made, use or have used, sell or have sold, or otherwise dispose of according to law any machine, article of manufacture or composition of matter physically embodying the invention, or to use or have used the process or method comprising the invention.

(c) "Practical application" means the manufacture in the case of a composition of matter or product, the use in the case of a process, or the operation in the case of a machine, under such conditions as to establish that the invention is being utilized and that its benefits are reasonably accessible to the public.

(d) "Special invention" means any invention designated by the NASA Assistant General Counsel for Patent Matters to be subject to short-form licensing procedures. An invention may be designated as a special invention when a determination is made that:

(1) Practical application has occurred and is likely to continue for the life of the patent and for which an exclusive license is not in force, or

(2) The public interest would be served by the expeditious granting of a nonexclusive license for practice of the invention by the public.

(e) The "Administrator" means the Administrator of the National Aeronautics and Space Administration, or his designee.

(f) "Government" means the Government of the United States of America.

(g) The "Inventions and Contributions Board" means the NASA Inventions and Contributions Board established by the Administrator of NASA within the Administration in accordance with section 305 of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457).

§ 1245.202 Basic considerations.

(a) Much of the new technology resulting from NASA sponsored research and development in aeronautical and space activities has application in other fields. NASA has special authority and responsibility under the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2451), to provide for the widest practical dissemination and utilization of this new technology. In addition, NASA has been given unique requirements to protect the inventions resulting from NASA activities and to promulgate licensing regulations to encourage commercial use of these inventions.

(b) NASA-owned inventions will best serve the interests of the United States when they are brought to practical application in the shortest time possible. Although NASA encourages the nonexclusive licensing of its inventions to promote competition and achieve their widest possible utilization, the commercial development of certain inventions calls for a substantial capital investment which private manufacturers may be unwilling to risk under a nonexclusive license. It is the policy of NASA to seek exclusive licensees when such licenses will provide the necessary incentive to the licensee to achieve early practical application of the invention.

(c) The Administrator, in determining whether to grant an exclusive license, will evaluate all relevant information submitted by applicants and all other persons and will consider the necessity for further technical and market development of the invention, the capabilities of prospective licensees, their proposed plans to undertake the required investment and development, the impact on competitors, and the benefits of the license to the Government and to the public. Preference for exclusive license shall be given to U.S. citizens or companies who intend to manufacture or use, in the case of a process, the invention in the United States of America, its territories and possessions. Consideration may also be given to assisting small businesses and minority business enterprises, as well as economically depressed, low income and labor surplus areas.

(d) All licenses for inventions shall be by express written instruments. No license shall be granted either expressly or by implication, for a NASA invention except as provided for in §§ 1245.203 and 1245.204 and in any existing or future treaty or agreement between the United States and any foreign government.

(e) Licenses for inventions covered by NASA-owned foreign patents and patent applications shall be granted in accordance with the NASA Foreign Patent Licensing Regulations (§ 1245.4).

§ 1245.203 Licenses for practical application of inventions.

(a) *General.* As an incentive to encourage practical application of inventions, licenses will be granted to responsible applicants according to the circumstances and conditions set forth in this section.

(b) *Nonexclusive licenses.* (1) Each invention will be made available to responsible applicants for nonexclusive, revocable licensing in accordance with § 1245.206, consistent with the provisions of any existing exclusive license.

(2) The duration of the license shall be for a period as specified in the license.

(3) The license shall require the licensee to achieve the practical application of the invention and to then practice the invention for the duration of the license.

(4) The license may be granted for all or less than all fields of use of the invention and throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(5) The license shall extend to the subsidiaries and affiliates of the licensee and shall be nonassignable without approval of the Administrator, NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(c) *Short-form nonexclusive licenses.* A nonexclusive, revocable license for a special invention, as defined in § 1245.201(d), shall be granted upon written request, to any applicant by the Patent Counsel of the NASA installation having cognizance of the invention.

(d) *Exclusive licenses.* (1) A limited exclusive license may be granted on an invention available for such licensing provided that:

(i) The Administrator has determined that: (*a*) The invention has not been brought to practical application by a nonexclusive licensee in the fields of use or in the geographical locations covered by the application for the exclusive license, (*b*) practical application of the invention in the fields of use or geographical locations covered by the application for the exclusive license is not likely to be achieved expeditiously by the further funding of the invention by the Government or under a nonexclusive license requested by any applicant pursuant to these regulations, and (*c*) the exclusive license will provide the necessary incentive to the licensee to achieve the practical application of the invention; and

(ii) Either a notice pursuant to

§ 1245.205 listing the invention as available for licensing has been published in the FEDERAL REGISTER for at least 9 months; or a patent covering the invention has been issued for at least 6 months. However, a limited exclusive license may be granted prior to the periods specified above if the Administrator determines that the public interest will best be served by the earlier grant of an exclusive license.

(2) The license may be granted for all or less than all fields of use of the invention, and throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(3) The exclusive period of the license shall be negotiated, but shall be for less than the terminal portion of the patent, and shall be related to the period necessary to provide a reasonable incentive to invest the necessary risk capital.

(4) The license shall require the licensee to practice the invention within a period specified in the license and then to achieve practical application of the invention.

(5) The license shall require the licensee to expend a specified minimum sum of money and/or to take other specified actions, within indicated period(s) after the effective date of the license, in an effort to achieve practical application of the invention.

(6) The license shall be subject to at least an irrevocable royalty-free right of the Government of the United States to practice and have practiced the invention throughout the world by or on behalf of the Government of the United States and on behalf of any foreign government pursuant to any existing or future treaty or agreement with the United States.

(7) The license may reserve to the Administrator, NASA, under the following circumstances, the right to require the granting of a sublicense to responsible applicant(s) on terms that are considered reasonable by the Administrator, taking into consideration the current royalty rates under similar patents and other pertinent facts: (i) To the extent that the invention is required for public use by Government regulation, or (ii) as may be necessary to fulfill health or safety needs, or (iii) for other purposes stipulated in the license.

(8) The license shall be nontransferable except to the successor of that part of the licensee's business to which the invention pertains.

(9) Subject to the approval of the Administrator, the licensee may grant sublicenses under the license. Each sublicense granted by an exclusive licensee shall make reference to and shall provide that the sublicense is subject to the terms of the exclusive license including the rights retained by the Government under the exclusive license. A copy of each sublicense shall be furnished to the Administrator.

(10) The license may be subject to such other reservations as may be in the public interest.

§ 1245.204 Other licenses.

(a) License to contractor. There is hereby granted to the contractor reporting an invention made in the performance of work under a contract of NASA in the manner specified in section 305(a)(1) or (2) of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457(a)(1) or (2)), a revocable, nonexclusive, royalty-free license for the practice of such invention, together with the right to grant sublicenses of the same scope to the extent the contractor was legally obligated to do so at the time the contract was awarded. Such license and right is nontransferable except to the successor of that part of the contractor's business to which the invention pertains.

(b) *Miscellaneous licenses.* Subject to any outstanding licenses, nothing in this subpart 2 shall preclude the Administrator from granting other licenses for inventions, when he determines that do so would provide for an equitable distribution of rights. The following exemplify circumstances wherein such licenses may be granted:

(1) In consideration of the settlement of an interference;

(2) In consideration of a release of a claim of infringement; or

(3) In exchange for or as part of the consideration for a license under adversely held patent(s).

§ 1245.205 Publication of NASA inventions available for license.

(a) A notice will be perodically published in the FEDERAL REGISTER listing inventions available for licensing. Abstracts of the inventions will also be published in the NASA Scientific and Technical Aerospace Reports (STAR) and other NASA publications.

(b) Copies of pending patent applications for inventions abstracted in STAR may be purchased from the National Technical Information Service, Springfield, Va. 22151.

§ 1245.206 Application for nonexclusive license.

(a) *Submission of application.* An application for nonexclusive license under § 1245.203(b) or a short-form nonexclusive license for special inventions under § 1245.203(c) shall be addressed to the NASA Patent Counsel of the NASA installation having cognizance over the NASA invention for which a license is desired or to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for nonexclusive license.* An application for nonexclusive license under § 1245.203(b) shall include:

(1) Identification of invention for which license is desired, including the NASA patent case number, patent application serial number of patent number, title and date, if known;

(2) Name and address of the person, company or organization applying for license and whether the applicant is a U.S. citizen or a U.S. corporation;

(3) Name and address of representative of applicant to whom correspondence should be sent;

(4) Nature and type of applicant's business;

(5) Number of employees;

(6) Purpose for which license is desired;

(7) A statement that contains the applicant's best knowledge of the extent to which the invention is being practiced by private industry and the Government;

(8) A description of applicant's capability and plan to undertake the development and marketing required to achieve the practical application of the invention, including the geographical location where the applicant plans to manufacture or use, in the case of a process, the invention; and

(9) A statement indicating the minimum term of years the applicant desires to be licensed.

(c) *Contents of an application for a short-form nonexclusive license.* An application for a short-form nonexclusive license under § 1245.203(c) for a special invention shall include:

(1) Identification of invention for which license is desired, including the NASA patent case number, patent application serial number or patent number, title and date, if known;

(2) Name and address of company or organization applying for license; and

(3) Name and address of representative of applicant to whom correspondence should be sent.

§ 1245.207 Application for exclusive license.

(a) *Submission of application.* An application for exclusive license under § 1245.203(d) may be submitted to NASA at any time. An application for exclusive license shall be addressed to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for exclusive license.* In addition to the requirements set forth in § 1245.206(b), the application for an exclusive license shall include:

(1) Applicant's status, if any, in any one or more of the following categories:

(i) Small business firm;

(ii) Minority business enterprise;

(iii) Location in a surplus labor area;

(iv) Location in a low-income urban area; and

(v) Location in an area designed by the Government as economically depressed.

(2) A statement indicating the time, expenditure, and other acts which the applicant considers necessary to achieve practical application of the invention, and the applicant's offer to invest that sum and to perform such acts if the license is granted;

(3) A statement whether the applicant would be willing to accept a license for all or less than all fields of use of the invention throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(4) A statement indicating the amount of royalty fees or other consideration, if any, the applicant would be willing to pay the Government for the exclusive license; and

(5) Any other facts which the applicant believes to show it to be in the interests of the United States of America for the Administrator to grant an exclusive license rather than a nonexclusive li-

cense and that such an exclusive license should be granted to the applicant.

§ 1245.208 Processing applications for license.

(a) *Initial review.* Applications for nonexclusive and exclusive licenses under §§ 1245.206 and 1245.207 will be reviewed by the Patent Counsel of the NASA installation having cognizance for the invention and the NASA Assistant General Counsel for Patent Matters, to determine the conformity and appropriateness of the application for license and the availability of the specific invention for the license requested. The Assistant General Counsel for Patent Matters will forward all applications for license conforming to §§ 1245.206(b) and 1245.207(b) to the NASA Inventions and Contributions Board when the invention is available for consideration of the requested license. Prior to forwarding applications for exclusive licenses to the Inventions and Contributions Board, notice in writing will be given to each nonexclusive licensee for the specific invention advising of the receipt of the application for the exclusive license and providing each nonexclusive licensee with a 30-day period for submitting either evidence that practical application of the invention has occurred or is about to occur or, an application for an exclusive license for the invention.

(b) *Recommendations of Inventions and Contributions Board.* The Inventions and Contributions Board shall, in accordance with the basic considerations set forth in §§ 1245.202 and 1245.203, evaluate all applications for license forwarded by the Assistant General Counsel for Patent Matters. Based upon the facts presented to the Inventions and Contributions Board in the application and any other facts in its possession, the Inventions and Contributions Board shall recommend to the Administrator: (1) Whether a nonexclusive or exclusive license should be granted, (2) the identity of the licensee, and (3) any special terms or conditions of the license.

(c) *Determination of Administrator and grant of nonexclusive licenses.* The Administrator shall review the recommendations of the Inventions and Contributions Board and shall determine whether to grant the nonexclusive license as recommended by the Board. If the Administrator determines to grant the license, the license will be granted upon the negotiation of the appropriate terms and conditions of the Office of General Counsel.

(d) *Determination of Administrator and grant of exclusive licenses*—(1) *Notice.* If the Administrator determines that the best interest of the United States will be served by the granting of an exclusive license in accordance with the basic considerations set forth in §§ 1245.202 and 1245.203, a notice shall be published in the FEDERAL REGISTER announcing the intent to grant the exclusive license, the identification of the invention, special terms or conditions of the proposed license, and a statement that NASA will grant the exclusive license unless within 30 days of the publication of such notice the Inventions and Contributions Board receives in writing any of the following together with supporting documentation:

(i) A statement from any person setting forth reasons why it would not be in the best interest of the United States to grant the proposed exclusive license; or

(ii) An application for a nonexclusive license under such invention, in accordance with § 1245.206(b), in which applicant states that he has already brought or is likely to bring the invention to practical application within a reasonable period.

The Inventions and Contributions Board shall, upon receipt of a written request within the 30 days' notice period, grant an extension of 30 days for the submission of the documents designated above.

(2) *Recommendation of Inventions and Contributions Board.* Upon the expiration of the period required by subparagraph (1) of this paragraph, the Board shall review all written responses to the notice and shall then recommend to the Administrator whether to grant the exclusive license as the Board initially recommended or whether a different form of license, if any, should instead be granted.

(3) *Grant of exclusive licenses.* The Administrator shall review the Board's recommendation and shall determine if the interest of the United States would best be served by the grant of an exclusive license as recommended by the Board. If the Administrator determines to grant the exclusive license, the license will be granted upon the negotiation of the appropriate terms and conditions by the Office of General Counsel.

§ 1245.209 Royalties and fees.

(a) Normally, a nonexclusive license for the practical application of an invention granted to a U.S. citizen or company will not require the payment of royalties; however, NASA may require other consideration.

(b) An exclusive license for an invention may require the payment of royalties, fees or other consideration when the licensing circumstances and the basic considerations in § 1245.202, considered together, indicate that it is in the public interest to do so.

§ 1245.210 Reports.

A license shall require the licensee to submit periodic reports of his efforts to work the invention. The reports shall contain information within his knowledge, or which he may acquire under normal business practice, pertaining to the commercial use that is being made of the invention and such other information which the Administrator may determine pertinent to the licensing program and which is specified in the license.

§ 1245.211 Revocation of licenses.

(a) Any license granted pursuant to § 1245.203 may be revoked, either in part or in its entirety, by the Administrator if in his opinion the licensee at any time shall fail to use adequate efforts to bring to or achieve practical application of the invention in accordance with the terms of the license, or if the licensee at any time shall default in making any report required by the license, or shall make any false report, or shall commit any breach of any covenant or agreement therein contained, and shall fail to remedy any such default, false report, or breach within 30 days after written notice, or if the patent is deemed unenforceable either by the Attorney General or a final decision of a U.S. court.

(b) Any license granted pursuant to § 1245.204(a) may be revoked, either in part or in its entirety, by the Administrator if in his opinion such revocation is necessary to achieve the earliest practical application of the invention pursuant to an application for exclusive license submitted in accordance with § 1245.207, or the licensee at any time shall breach any covenant or agreement contained in the license, and shall fail to remedy any such breach within 30 days after written notice thereof.

(c) Before revoking any license granted pursuant to this Subpart 2 for any cause, there will be furnished to the licensee a written notice of intention to revoke the license, and the licensee will be allowed 30 days after such notice in which to appeal and request a hearing before the Inventions and Contributions Board on the question of revocation. After a hearing, the Inventions and Contributions Board shall transmit to the Administrator the record of proceedings, its findings of fact, and its recommendation whether the license should be revoked either in part or in its entirety. The Administrator shall review the recommendation of the Board and determine whether to revoke the license in part or in its entirety. Revocation of a license shall include revocation of all sublicenses which have been granted.

§ 1245.212 Appeals.

Any person desiring to file an appeal pursuant to § 1245.211(c) shall address the appeal to Chairman, Inventions and Contributions Board. Any person filing an appeal shall be afforded an opportunity to be heard before the Inventions and Contributions Board, and to offer evidence in support of his appeal. The procedures to be followed in any such matter shall be determined by the Administrator. The Board shall make findings of fact and recommendations with respect to disposition of the appeal. The decision on the appeal shall be made by the Administrator, and such decision shall be final and conclusive, except on questions of law, unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

§ 1245.213 Litigation.

An exclusive licensee shall be granted the right to sue at his own expense any party who infringes the rights set forth in his license and covered by the licensed patent. The licensee may join the Government, upon consent of the Attorney General, as a party complainant in such suit, but without expense to the Government and the licensee shall pay costs and any final judgment or decree that may be rendered against the Govern-

ment in such suit. The Government shall also have an absolute right to intervene in any such suit at its own expense. The licensee shall be obligated to promptly furnish to the Government, upon request, copies of all pleadings and other papers filed in any such suit and of evidence adduced in proceedings relating to the licensed patent including, but not limited to, negotiations for settlement and agreements settling claims by a licensee based on the licensed patent, and all other books, documents, papers, and records pertaining to such suit. If, as a result of any such litigation, the patent shall be declared invalid, the licensee shall have the right to surrender his license and be relieved from any further obligation thereunder.

§ 1245.214 Address of communications.

(a) Communications to the Assistant General Counsel for Patent Matters in accordance with §§ 1245.206 and 1245.207 and requests for information concerning licenses for NASA inventions should be addressed to the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D.C. 20546.

(b) Communications to the Inventions and Contributions Board in accordance with §§ 1245.208, 1245.211, and 1245.212 should be addressed to Chairman, Inventions and Contributions Board, National Aeronautics and Space Administration, Washington, D.C. 20546.

Effective date. The regulations set forth in this subpart 2 are effective April 1, 1972.

JAMES C. FLETCHER,
Administrator.

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C.F.R. 1245.4), a copy of which is available from any NASA Patent Counsel.

TABLE OF CONTENTS

Section 1 • Abstracts

43 EARTH RESOURCES N.A.
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.
For instrumentation see *35 Instrumentation and Photography.*

44 ENERGY PRODUCTION AND CONVERSION 45
Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.
For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

45 ENVIRONMENT POLLUTION 51
Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

46 GEOPHYSICS N.A.
Includes aeronomy; upper and lower atmosphere studies; ionospheric and magnetospheric physics; and geomagnetism.
For space radiation see *93 Space Radiation.*

47 METEOROLOGY AND CLIMATOLOGY 52
Includes weather forecasting and modification.

48 OCEANOGRAPHY N.A.
Includes biological, dynamic and physical oceanography; and marine resources.

LIFE SCIENCES

Includes life sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

51 LIFE SCIENCES (GENERAL) 52
Includes genetics.

52 AEROSPACE MEDICINE 52
Includes physiological factors; biological effects of radiation; and weightlessness.

53 BEHAVIORAL SCIENCES N.A.
Includes psychological factors; individual and group behavior; crew training and evaluation; and psychiatric research.

54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT 54
Includes human engineering; biotechnology; and space suits and protective clothing.

55 PLANETARY BIOLOGY N.A.
Includes exobiology; and extraterrestrial life.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

59 MATHEMATICAL AND COMPUTER SCIENCES (GENERAL) N.A.

60 COMPUTER OPERATIONS AND HARDWARE 55
Includes computer graphics and data processing.
For components see *33 Electronics and Electrical Engineering.*

61 COMPUTER PROGRAMMING AND SOFTWARE 57
Includes computer programs, routines, and algorithms.

62 COMPUTER SYSTEMS N.A.
Includes computer networks.

63 CYBERNETICS N.A.
Includes feedback and control theory.
For related information see also *54 Man/System Technology and Life Support.*

64 NUMERICAL ANALYSIS N.A.
Includes iteration, difference equations, and numerical approximation.

65 STATISTICS AND PROBABILITY N.A.
Includes data sampling and smoothing; Monte Carlo method; and stochastic processes.

66 SYSTEMS ANALYSIS 57
Includes mathematical modeling; network analysis; and operations research.

67 THEORETICAL MATHEMATICS N.A.
Includes topology and number theory.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

70 PHYSICS (GENERAL) N.A.
For geophysics see *46 Geophysics.* For astrophysics see *90 Astrophysics.* For solar physics see *92 Solar Physics.*

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

JULY 1976 (Supplement 9)

NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02 AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer.*

N76-16014* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

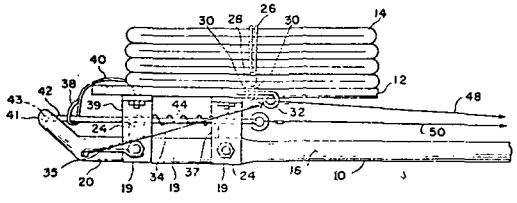
DEPLOY/RELEASE SYSTEM Patent

David B. Robelen, inventor (to NASA) Issued 6 Jan. 1976 6 p Filed 27 Nov. 1974 Supersedes N75-12195 (13 - 03, p 0287)

(NASA-Case-LAR-11575-1; US-Patent-3,930,628; US-Patent-Appl-SN-527727; US-Patent-Class-244-139) Avail: US Patent Office CSCL 01A

An apparatus is disclosed for arresting uncontrollable motions of model aircraft. A signal is used to deploy a parachute when a model aircraft is in a motion, such as a tailspin, from which the operator cannot recover by manipulating the flight surfaces. After the model aircraft is stabilized to a point where the operator can arrest the uncontrollable motion the parachute is jettisoned and normal flight resumed. The deploy and jettison signals may be sent using a single channel of a multi-channel transmitter and are completely independent of each other.

Official Gazette of the U.S. Patent Office



04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Spacecraft Communications, Command, and Tracking* and *32 Communications.*

N76-20114* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

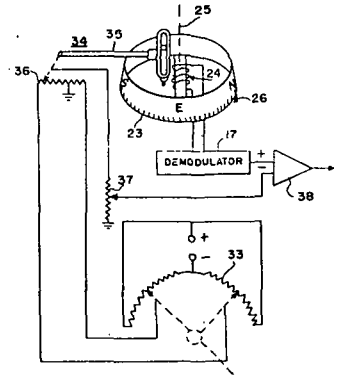
MAGNETIC HEADING REFERENCE Patent

Howell D. Garner, inventor (to NASA) Issued 16 Mar. 1976 12 p Filed 11 Dec. 1974 Supersedes N75-12947 (13 - 04, p 0382)

(NASA-Case-LAR-11387-1; US-Patent-3,943,763; US-Patent-Appl-SN-531647; US-Patent-Class-75-178R; US-Patent-Class-33-356) Avail: US Patent Office CSCL 17G

A magnetometer is used as a magnetic heading reference for a vehicle such as a small aircraft. The magnetometer is mounted on a directional dial in the aircraft in the vicinity of the pilot such that it is free to turn with the dial about the yaw axis of the aircraft. A circuit is included for generating a signal proportional to the northerly turning error produced in the magnetometer due to the vertical component of the earth's magnetic field. This generated signal is then subtracted from the output of the magnetometer to compensate for the northerly turning error.

Official Gazette of the U.S. Patent Office



07 AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

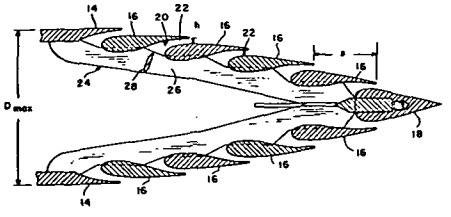
For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

N76-18117* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

CASCADE PLUG NOZZLE Patent

Blake W. Corson, Jr., inventor (to NASA) Issued 17 Feb. 1976 9 p Filed 12 Jul. 1974 Continuation-in-part of abandoned US Patent Appl. SN-331759, filed 13 Feb. 1973 (NASA-Case-LAR-11674-1; US-Patent-3,938,742; US-Patent-Appl-SN-488616; US-Patent-Class-239-265.11; US-Patent-Class-181-33HC; US-Patent-Appl-SN-331759) Avail: US Patent Office CSCL 21E

An exhaust nozzle for a jet aircraft which provides jet noise suppression is described. The nozzle includes a plurality of coaxial airfoil ring segments which are spaced serially along the longitudinal axis of the nozzle to define a plurality of annular coaxial channels. The diameters of the segments progressively decrease downstream along this axis and the exits of the channels are non-coplanar. The radial depths of the channels are small as compared with the axial distance between adjacent channel exits so that noise is emitted nonsimultaneously from the channel exits as a series of weakened pulses staggered in time. The boattail angles of the outer surfaces of the ring airfoil segments increase in magnitude with increasing distance downstream to reduce drag. Official Gazette of the U.S. Patent Office

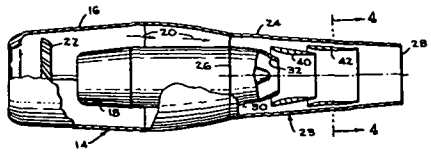


N76-18131*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

NOISE SUPPRESSOR FOR TURBO FAN JET ENGINES Patent Application

Dah Yu Cheng, inventor (to NASA) (Santa Clara Univ.) Filed 13 Feb. 1976 17 p Sponsored by NASA (NASA-Case-ARC-10812-1; US-Patent-Appl-SN-657903) Avail: NTIS HC $3.50 CSCL 21E

A noise suppressor for installation on the discharge or aft end of a turbofan engine is described. Within the suppressor are fixed annular airfoils which are positioned to reduce the relative velocity between the high temperature fast moving jet exhaust and the low temperature slow moving air. Within the suppressor nacelle is an exhaust jet nozzle which constrains the shape of the jet exhaust to a substantially uniform elongate shape irrespective of the power setting of the engine. Fixed ring airfoils within the suppressor nacelle have the same salutary effects irrespective of the power setting at which the engine is operated. NASA



08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N76-19159*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

[TRANSONIC AND SUPERSONIC AIRCRAFT WHEREIN THE PROBLEMS OF ROLL CONTROL AT HIGH ANGLES OF ATTACK ARE MINIMIZED] Patent Application

John G. Lamar, inventor (to NASA) Filed 21 Jan. 1976 11 p (NASA-Case-LAR-11868-1; US-Patent-Appl-SN-651002) Avail: NTIS HC $3.50 CSCL 01C

A wing, for aircraft of cropped arrow-type planform with thin leading and side edges, with a pivotable tip to alter the crop angle of the wing during flight is examined. Increasing the crop angle causes the wing side edge to become a trailing edge thereby reducing the wing surface area which the leading edge and side edge shed vortex systems can act against. This reduction also diminishes the strength of the shed vortex system; decreasing the crop angle cause opposite results. The wing constitutes a roll control device for aircraft of the stated design and is particularly effective at higher angles of attack. NASA

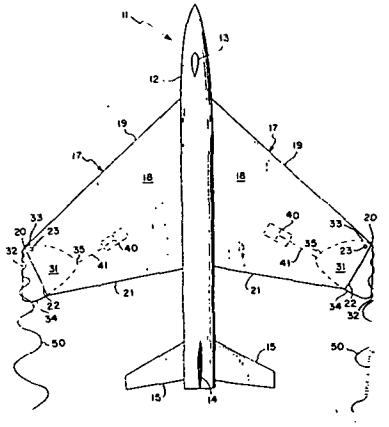


FIG. 1

09 RESEARCH AND SUPPORT FACILITIES (AIR)

Includes airports, hangars and runways; aircraft repair and overhaul facilities; wind tunnels; shock tube facilities; and engine test blocks. For related information see also *14 Ground Support Systems and Facilities (Space).*

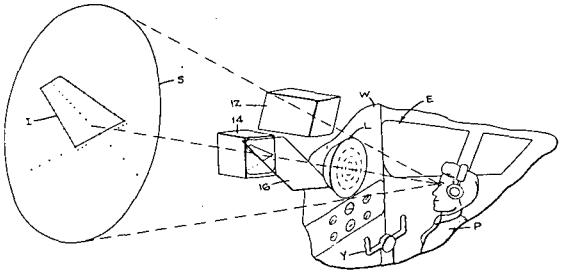
N76-10148*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FULL COLOR HYBRID DISPLAY FOR AIRCRAFT SIMULATORS Patent Application

Wendell D. Chase, inventor (to NASA) Filed 17 Oct. 1975 26 p

(NASA-Case-ARC-10903-1; US-Patent-Appl-SN-623536) Avail: NTIS HC $3.75 CSCL 14B

A display for an aircraft simulator is described that produces an image of an air strip accurate in color and in relative light intensity. Components of the system include: a television camera supported over a terrain model simulating an aircraft landing zone; a full spectrum color monitor connected to the camera; lens system for projecting the monitor image onto a lens or screen visually accessible to a trainee in the simulator; a monochromatic calligraphic display; a digital computer for producing a pattern on the display that corresponds to the lights associated with the landing strip on the terrain model; an optical system for projecting the calligraphic image onto same lens so that it is superimposed on the video representation of the landing field; and a servo feedback system responsive to the position and velocity of the servo motors on the gantry frame for producing an input to the computer so that the calligraphically generated signal corresponds in shape, size, and location to the video signal. NASA



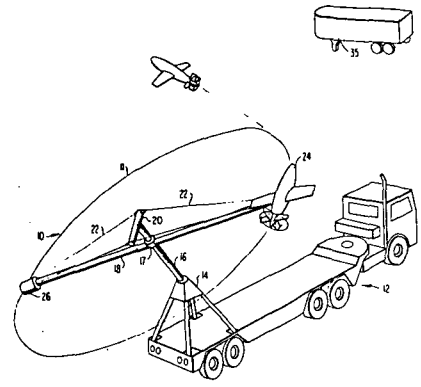
N76-13116*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ROTATING LAUNCH DEVICE FOR A REMOTELY PILOTED AIRCRAFT Patent Application

Thomas J. Gregory, inventor (to NASA) Filed 28 Aug. 1975 13 p

(NASA-Case-ARC-10979-1; US-Patent-Appl-SN-608483) Avail: NTIS HC $3.50 CSCL 14B

A method and apparatus for launching a remotely piloted aircraft is described. The aircraft is revolved about a fixed pivot point until a predetermined speed is reached. The vehicle is then released from the launching apparatus. The vehicle is attached to one end of a rotatable arm, the imbalance on the arm being counteracted by a counter weight attached to the opposite end. The counter weight is released from the arm at the same time as the aircraft so as to avoid structural damage to the apparatus caused by rotation in the unbalanced condition. The arm is oriented such that it rotates in a plane inclined obliquely to the local gravitational field of the launch site. The supporting structure for the arm may be made stationary or may be attached to a mobile vehicle for ground transportation. NASA



12 ASTRONAUTICS (GENERAL)

For extraterrestrial exploration see *91 Lunar and Planetary Exploration.*

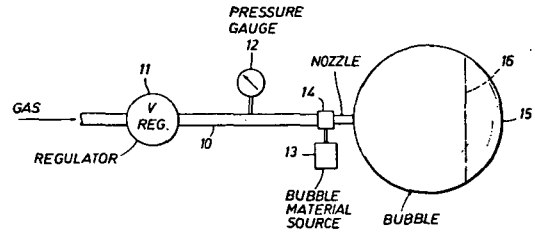
N76-15189* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

METHOD FOR MANUFACTURING MIRRORS IN ZERO GRAVITY ENVIRONMENT Patent

David E. Pitts, inventor (to NASA) Issued 16 Dec. 1975 11 p Filed 27 Feb. 1974 Supersedes N74-33142 (12 - 22, p 2730)

(NASA-Case-MSC-12611-1; US-Patent-3,927,227; US-Patent-Appl-SN-446560; US-Patent-Class-427-162; US-Patent-Class-350-288; US-Patent-Class-350-293; US-Patent-Class-427-250) Avail: US Patent Office CSCL 20F

A system for forming large mirror surfaces in zero gravity space environments was described and illustrated. In particular, it relates to methods and apparatus for coating a curved surface in a zero gravity environment with a vaporizable metal to form a mirror. The technique consists in locating a shaped surface in a space orbit, orienting the central axis of the section toward the sun and vaporizing a finite amount of vaporizable metal (in amount calculated to provide a thin layer of metal) onto the surface of the section. A shaped surface can be formed by inflating a plastic to a spherical shape and hardening it. Y.J.A.



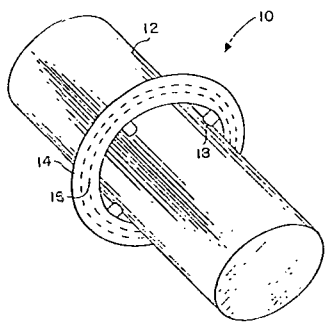
15 LAUNCH VEHICLES AND SPACE VEHICLES

Includes boosters; manned orbital laboratories; reusable vehicles; and space stations.

N76-14158* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ANNULAR MOMENTUM CONTROL DEVICE USED FOR STABILIZATION OF SPACE VEHICLES AND THE LIKE Patent
Willard W. Anderson and Nelson J. Groom, inventors (to NASA) Issued 28 Oct. 1975 6 p Filed 1 Aug. 1973 Supersedes N73-28646 (11 - 19, p 2318)
(NASA-Case-LAR-11051-1; US-Patent-3,915,416; US-Patent-Appl-SN-384773; US-Patent-Class-244-165; US-Patent-Class-74-5.7; US-Patent-Class-244-3.21) Avail: US Patent Office CSCL 22B

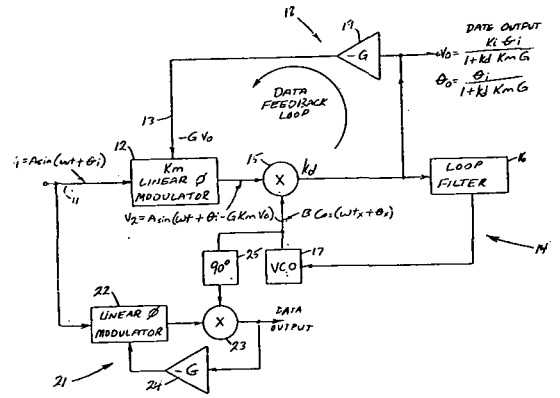
An annular momentum storage device for stabilization of space vehicles about two axes perpendicular to the axis of rotation of the annular momentum storage device is described. The body of the vehicle is centrally located within the annulus of an annular shaped rotating inertial mass. Magnetic bearings support the inertial mass and are attached to a toroidal shaped housing which encloses the inertial mass. A linear induction motor is mounted along either the inner or outer periphery of the inertial mass for driving the same. Suitable projecting members are attached between the centrally located body of the vehicle and the housing containing the inertial mass.

Official Gazette of the U.S. Patent Office



N76-13169*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
LINEAR PHASE DEMODULATOR Patent Application
Ronnie R. Rippy, inventor (to NASA) Filed 26 Nov. 1975 24 p
(NASA-Case-GSC-12018-1; US-Patent-Appl-SN-635531) Avail: NTIS HC $3.50 CSCL 17B

A phase locked loop type demodulator for a phase modulated wave which may have no carrier power is disclosed. The demodulator has a means for deriving an ac data output signal with a magnitude and a phase indicative of the phase of the modulated wave. A feedback loop responsive to the data output signal restores power to the carrier frequency component to the loop. Preferably, the phase modulator is linear and includes a series inductance-capacitance network, where the capacitor is a voltage controlled varactor. To compensate for nonlinearities in the varactor reactance vs. voltage characteristic, the series circuit is shunted by a properly selected inductance. NASA



17 SPACECRAFT COMMUNICATIONS, COMMAND AND TRACKING

Includes telemetry; space communications networks; astronavigation; and radio blackout.

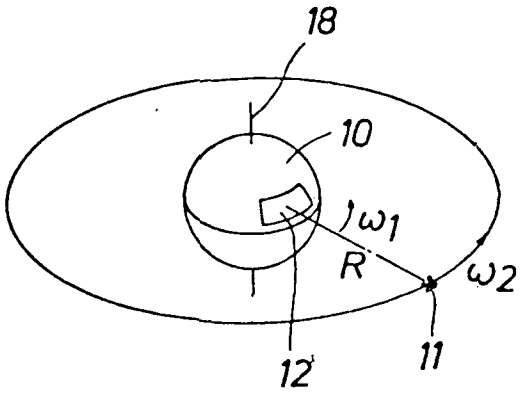
For related information see also *04 Aircraft Communications and Navigation* and *32 Communications.*

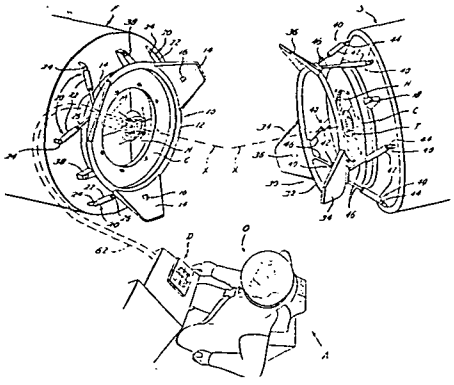
N76-21250* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
POSITION DETERMINATION SYSTEMS Patent
Paul W. Shores, inventor (to NASA) Issued 6 Apr. 1976 6 p Filed 28 Nov. 1973 Supersedes N74-14942 (12 - 06, p 0646)
(NASA-Case-MSC-12593-1; US-Patent-3,949,400; US-Patent-Appl-SN-419747; US-Patent-Class-343-100ST; US-Patent-Class-325-14; US-Patent-Class-343-100SA; US-Patent-Class-343-112TC) Avail: US Patent Office CSCL 17G

A system for an orbital antenna, operated at a synchronous altitude, to scan an area of a celestial body is disclosed. The antenna means comprises modules which are operated by a steering signal in a repetitive function for providing a scanning beam over the area. The scanning covers the entire area in a pattern and the azimuth of the scanning beam is transmitted to a control station on the celestial body simultaneous with signals from an activated ground beacon on the celestial body. The azimuth of the control station relative to the antenna is known

and the location of the ground beacon is readily determined from the azimuth determinations.

Official Gazette of the U.S. Patent Office





18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support*. For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics*.

N76-14186* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SPACECRAFT DOCKING AND ALIGNMENT SYSTEM Patent

Donald C. Cheatham and Richard Reid, inventors (to NASA) Issued 7 Oct. 1975 6 p Filed 15 Jun. 1973 Supersedes N73-26879 (11 - 17, p 2086)
(NASA-Case-MSC-12559-1; US-Patent-3,910,533; US-Patent-Appl-SN-370582; US-Patent-Class-244-161; US-Patent-Class-33-286; US-Patent-Class-35-12; US-Patent-Class-178-DIG.20; US-Patent-Class-356-153) Avail: US Patent Office CSCL 22B

A spacecraft docking alignment system is provided utilizing a three-dimensional target and screen mounted along the docking axis of one spacecraft and a television camera installed along the docking axis of the other spacecraft. A television display, with attendant electronics, is provided in the other spacecraft for viewing the relative alignment of the two spacecraft by the astronaut in control of the docking maneuver. Both spacecraft may be equipped with target, screen, camera, and display such that either spacecraft may control the docking maneuver.

Official Gazette of the U.S. Patent Office

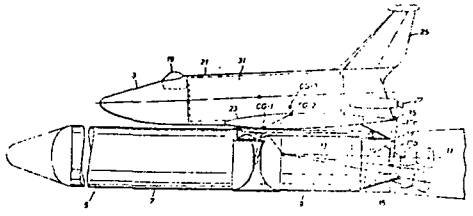
N76-17185* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SPACE VEHICLE SYSTEM Patent

Maxime A. Faget, William W. Petynia, and Willard M. Taub, inventors (to NASA) Issued 30 Dec. 1975 10 p Filed 5 Mar. 1974 Supersedes N74-33303 (12 - 22, p 2752)
(NASA-Case-MSC-12561-1; US-Patent-3,929,306; US-Patent-Appl-SN-448323; US-Patent-Class-244-162; US-Patent-Class-244-172) Avail: US Patent Office CSCL 22A

A space vehicle system is described which consists of an orbiter vehicle having an expendable propellant tank attached to the underside surface. An engine module is retractably supported from the aft end of the orbiter vehicle and extend so as to be in axial alignment with the propellant tank when in operation. After the engine has consumed the propellant, it is retracted into the orbiter vehicle and the tank is jettisoned thus reducing orbiter weight and improving flight characteristics.

Official Gazette of the U.S. Patent Office

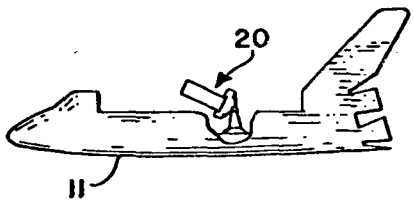


19 SPACECRAFT INSTRUMENTATION

For related information see also *06 Aircraft Instrumentation* and *35 Instrumentation and Photography.*

N76-18227*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
MAGNETIC SUSPENSION AND POINTING SYSTEM Patent Application
Willard W. Anderson and Nelson J. Groom, inventors (to NASA) Filed 27 Feb. 1976 10 p
(NASA-Case-LAR-11889-1; US-Patent-Appl-SN-662182) Avail: NTIS HC $3.50 CSCL 14B

Apparatus for providing accurate pointing of instruments on a carrier vehicle and for providing isolation of the instruments from the vehicle's motion disturbances is described. The apparatus includes two assemblies, with connecting interfaces, each assembly having a separate function. The first assembly is attached to the carrier vehicle and consists of an azimuth gimbal and an elevation gimbal which provide coarse pointing of the instruments by allowing two rotations of the instruments relative to the carrier vehicle. The second or vernier pointing assembly is made up of magnetic suspension and fine pointing actuators, roll motor segments, and an instrument mounting plate around which a continuous annular rim is attached which provides appropriate magnetic circuits for the actuators and the roll motor segments. The vernier pointing assembly is attached to the elevation gimbal and provides vernier attitude fine pointing and roll positioning of the instruments as well as six degree-of-freedom isolation from carrier motion disturbances. NASA



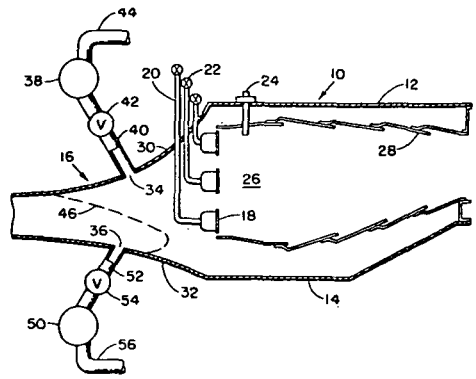
20 SPACECRAFT PROPULSION AND POWER

Includes main propulsion systems and components e.g., rocket engines; and spacecraft auxiliary power sources.

For related information see also *07 Aircraft Propulsion, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

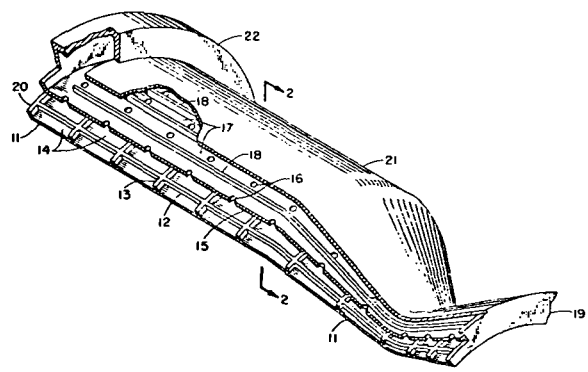
N76-14190* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CONTROLLED SEPARATION COMBUSTOR Patent
Albert J. Juhasz and Richard W. Niedzwiecki, inventors (to NASA) Issued 7 Oct. 1975 5 p Filed 24 May 1973 Supersedes N73-25816 (11 - 16, p 1955)
(NASA-Case-LEW-11593-1; US-Patent-3,910,035; US-Patent-Appl-SN-363691; US-Patent-Class-60-39.23; US-Patent-Class-60-39.29; US-Patent-Class-60-39.74R) Avail: US Patent Office CSCL 21H

A short annular combustor utilizing diffuser bleed to control the airflow distribution in a gas turbine engine at various operating conditions is described. Official Gazette of the U.S. Patent Office



N76-14191* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ROCKET CHAMBER AND METHOD OF MAKING Patent
Anthony Fortini, inventor (to NASA) Issued 7 Oct. 1975 4 p Filed 24 Jan. 1974 Supersedes N74-28232 (12 - 17, p 2084)
(NASA-Case-LEW-11118-2; US-Patent-3,910,039; US-Patent-Appl-SN-436316; US-Patent-Class-60-265; US-Patent-Class-60-267; US-Patent-Class-239-127.3) Avail: US Patent Office CSCL 21H

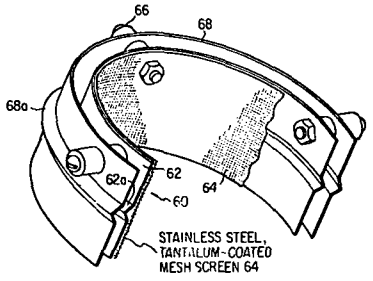
A transpiration cooled rocket chamber is made by forming a porous metal wall on a suitably shaped mandrel. The porous wall may be made of sintered powdered metal, metal fibers sintered on the mandrel, or wires woven onto the mandrel and then sintered to bond the interfaces of the wires. Intersecting annular and longitudinal ribs are then electroformed on the porous wall. An interchamber wall having orifices is then electroformed over the annular and longitudinal ribs. Parallel longitudinal ribs are then formed on the outside surface of the interchamber wall after which an annular jacket is electroformed over the parallel ribs to form distribution passages. A feed manifold communicating with the distribution passages may be fabricated and welded to the rocket chamber or the feed manifold may be electroformed in place. Official Gazette of the U.S. Patent Office



N76-19227*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ANODE FOR ION THRUSTER Patent Application
Bruce A. Banks, inventor (to NASA) Filed 8 Mar. 1976 12 p (NASA-Case-LEW-12048-1; US-Patent-Appl-SN-665033) Avail: NTIS HC $3.50 CSCL 21C

A screen anode for an ion thruster is described. The anode is constructed of a woven mesh screen, preferably of a stainless steel wire cloth with a mesh size less than the intergrid gap or openings of the screen grid or accelerator grid systems of the thruster. The screen anode is sputter coated with tantalum as a result of thruster operation. Because of the fineness of the screen anode any spalled material from the tantalum coated anode is in such small dimensions that the spalled pieces cannot interfere with the accelerator, screen grid systems, and the focusing.

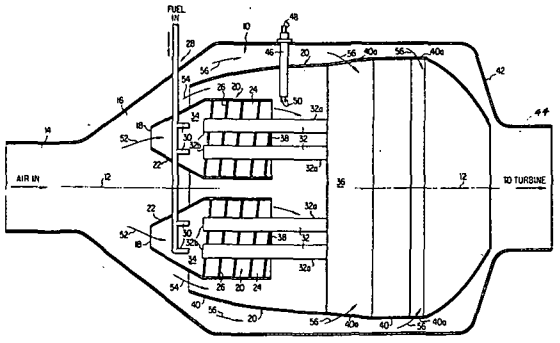
NASA



N76-20215*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FUEL COMBUSTOR Patent Application
Cecil J. Marek, inventor (to NASA) Filed 31 Mar. 1976 11 p (NASA-Case-LEW-12137-1; US-Patent-Appl-SN-672210) Avail: NTIS HC $3.50 CSCL 21H

A fuel combustor comprised of a chamber with air and fuel inlets and a combination gas outlet is described. The fuel is supplied to a vaporization zone and fuel and air are mixed in a pair of mixing chambers each exemplified by a swirl can. The resultant mixture is directed into a combustion zone within the combustor. Combustion products are exhausted, for example, into a turbine inlet. By use of the heat pipe means some of the heat of combustion is carried back upstream into the swirl cans, to vaporize the fuel as it enters the vaporization zone in the swirl can, thereby improving vaporization and fuel mixing. Fewer pollutants are formed and complete combustion is assisted because of the improved fuel vaporization and better mixing.

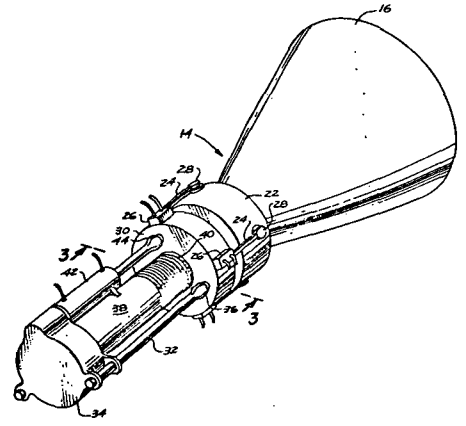
NASA



N76-21275* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
SYSTEM FOR IMPOSING DIRECTIONAL STABILITY ON A ROCKET-PROPELLED VEHICLE Patent
Harold Perkins, inventor (to NASA) Issued 6 Apr. 1976 6 p Filed 31 Jul. 1974 Supersedes N74-30311 (12 - 19, p 2353) (NASA-Case-MFS-21311-1; US-Patent-3,948,470; US-Patent-Appl-SN-493359; US-Patent-Class-244-3.22) Avail: US Patent Office CSCL 21H

An improved system for use in imposing directional stability on a rocket-propelled vehicle is described. The system includes a pivotally supported engine-mounting platform, a gimbal ring mounted on the platform and adapted to pivotally support a rocket engine and an hydraulic actuator connected to the platform for imparting selected pivotal motion. An accelerometer and a signal comparator circuit for providing error intelligence indicative of aberration in vehicle acceleration is included along with an actuator control circuit connected with the actuator and responsive to error intelligence for imparting pivotal motion to the platform. Relocation of the engine's thrust vector is thus achieved for imparting directional stability to the vehicle.

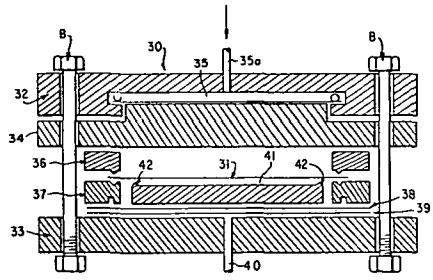
Official Gazette of the U.S. Patent Office



N76-21276* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD OF CONSTRUCTING DISHED ION THRUSTER GRIDS TO PROVIDE HOLE ARRAY SPACING COMPENSATION Patent
Bruce A. Banks, inventor (to NASA) Issued 6 Apr. 1976 4 p Filed 20 Jan. 1975 Supersedes N75-16624 (13 - 08, p 0863)
(NASA-Case-LEW-11876-1; US-Patent-3,947,933; US-Patent-Appl-SN-542157; US-Patent-Class-29-25.18) Avail: US Patent Office CSCL 21C

The center-to-center spacings of a photoresist pattern for an array of holes applied to a thin metal sheet are increased by uniformly stretching the thin metal sheet in all directions along the plane of the sheet. The uniform stretching is provided by securely clamping the periphery of the sheet and applying an annular force against the face of the sheet, within the periphery of the sheet and around the photoresist pattern. The technique is used in the construction of ion thruster grid units where the outer or downstream grid is subjected to uniform stretching prior to convex molding. The technique provides alignment of the

holes of grid pairs so as to direct the ion beamlets in a direction parallel to the axis of the grid unit and thereby provide optimization of the available thrust. Official Gazette of the U.S. Patent Office

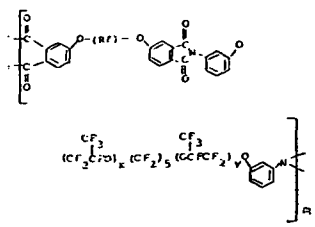


23 CHEMISTRY AND MATERIALS (GENERAL)

Includes biochemistry and organic chemistry.

N76-15268* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
POLYIMIDES OF ETHER-LINKED ARYL TETRACARBOXYLIC DIANHYDRIDES Patent
James A. Webster, inventor (to NASA) (Monsanto Res. Corp., Dayton, Ohio) Issued 9 Dec. 1975 8 p Filed 11 Jul. 1974 Supersedes N74-29480 (12 - 19, p 2246) Sponsored by NASA
(NASA-Case-MFS-22355-1; US-Patent-3,925,312;
US-Patent-Appl-SN-487852; US-Patent-Class-260-47CP;
US-Patent-Class-260-32.8N; US-Patent-Class-260-32.6N;
US-Patent-Class-260-78TF; US-Patent-Class-260-346.3;
US-Patent-Class-260-571) Avail: US Patent Office CSCL 07C

Polyimides comprised of repeating units containing a perfluoralkylene having the structure (CF2n) or a perfluoroalkylene ether having the structure (CF2)m-O-(CF2)m where n is an integer of 2 to 10, and m is an integer of 1 to 10, were found to possess improved thermal, oxidative and hydrolytic stability as well as improved physical and chemical characteristics. These properties make it useful in a variety of applications including that of a sealant in advanced aerospace structures.
Official Gazette of the U.S. Patent Office



24 COMPOSITE MATERIALS

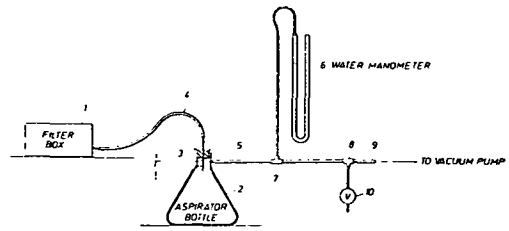
Includes laminates.

N76-14203* National Aeronautics and Space Administration. Pasadena Office, Calif.
PREVENTION OF HYDROGEN EMBRITTLEMENT OF HIGH STRENGTH STEEL BY HYDRAZINE COMPOSITIONS Patent
Leonard Weber, inventor (to NASA) (McDonnell-Douglas Corp., Santa Monica, Calif.) Issued 11 Nov. 1975 10 p Filed 28 Sep. 1973 Supersedes N74-20397 (12 - 11, p 1338) Sponsored by NASA
(NASA-Case-NPO-12122-1; US-Patent-3,919,014;
US-Patent-Appl-SN-401921; US-Patent-Class-149-36;
US-Patent-Class-423-407) Avail: US Patent Office CSCL 11D

Delayed failure of high strength steel alloys exposed to compositions containing hydrazine is prevented by addition of potassium hydroxide to the composition in an amount at least sufficient to neutralize acidic impurities. The removal of the acidic impurities eliminates evolution of hydrogen and thus avoids hydrogen embrittlement of the high strength steel alloys.
Official Gazette of the U.S. Patent Office

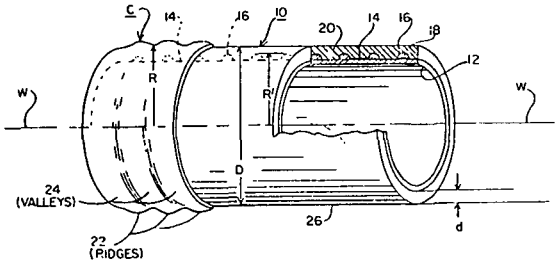
N76-14204* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
RECONSTITUTED ASBESTOS MATRIX Patent
Hoyt McBryar, inventor (to NASA) Issued 7 Oct. 1975 6 p Filed 22 Jan. 1973 Supersedes N73-16577 (11 - 07, p 0811)
(NASA-Case-MSC-12568-1; US-Patent-3,910,814;
US-Patent-Appl-SN-325784; US-Patent-Class-162-102;
US-Patent-Class-136-146; US-Patent-Class-136-148;
US-Patent-Class-162-153; US-Patent-Class-162-222;
US-Patent-Class-162-228) Avail: US Patent Office CSCL 11D

An asbestos matrix suitable for use in a fuel cell or electrolysis cell is produced. The cell has a greater porosity and bubble pressure for a given thickness, improved homogeneity, and more uniform thickness. The matrix is produced by first shredding the asbestos, forming a slurry of the asbestos with water or a low boiling hydrocarbon, preferably an alcohol such as methanol, forming a mat by passing the slurry through a properly sized porous plaque with a piece of filter paper on top, drying the mat, and rolling the mat to yield desired thickness and surface finish. Official Gazette of the U.S. Patent Office



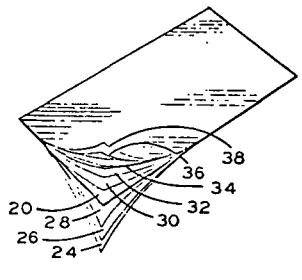
N76-16181*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED METHOD OF MAKING REINFORCED COMPOSITE STRUCTURES Patent Application
Lee C. McCandless (General Technologies Corp., Reston, Va.) and Glen E. Weber, inventors (to NASA) (General Technologies Corp., Reston, Va.) Filed 19 Apr. 1974 16 p
(Contract NAS3-15828)
(NASA-Case-LEW-12619-1; US-Patent-Appl-SN-462424) Avail: NTIS HC $3.50 CSCL 11D

A process is reported for making reinforced matrix composite structures of the type where reinforcing filament is wound on a body and metallic matrix material is electroformed on and between the windings to form each new layer of composite structure. The matrix material is then machined until a new smooth surface is attained on which to precision-wind the next filament convolutions with their flat sides in close contact and with the spacings between convolutions very closely controlled. NASA



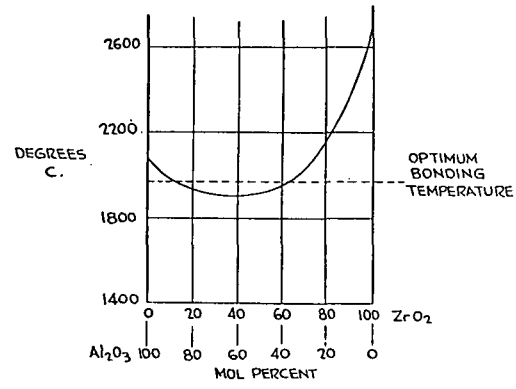
N76-19231*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
A METHOD FOR FABRICATING GRAPHITE/EPOXY LAMINATE FROM ULTRATHIN LAMINAE Patent Application
Bernard M. Burke, Sr. (Martin Marietta Corp., Denver) and John R. Lager, inventors (to NASA) (Martin Marietta Corp., Denver) Filed 10 Mar. 1976 11 p Sponsored by NASA
(NASA-Case-MFS-23229-1; US-Patent-Appl-SN-665364) Avail: NTIS HC $3.50 CSCL 11D

A method for fabricating graphite/epoxy laminate from ultrathin graphite/epoxy laminas is described. The method is characterized by forming an uncured laminate comprising a plurality of superimposed, ultrathin graphite/epoxy laminas, the fibers of each lamina being arranged in substantial parallelism and angularly related to the fibers of adjacent laminas. The uncured laminate is interposed between perforated backing laminas for forming a curing package which is vacuum bagged, preheated, and smoothed for removing surface irregularities. The package is subjected to pressure and temperature sufficient for curing the epoxy resin. NASA



N76-19234*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
BONDING OF SAPPHIRE TO SAPPHIRE BY EUTECTIC MIXTURE OF ALUMINUM OXIDE AND ZIRCONIUM OXIDE Patent Application
John J. DeLuca, inventor (to NASA) Filed 30 Dec. 1975 14 p
(NASA-Case-GSC-11577-3; US-Patent-Appl-SN-645502) Avail: NTIS HC $3.50 CSCL 11D

Bonding of an element comprising sapphire, ruby or blue sapphire to another element of such material with a eutectic mixture of aluminum oxide and zirconium oxide is reported. The bonding mixture may be applied in the form of a distilled water slurry or by electron beam vapor deposition. In one embodiment the eutectic is formed in situ by applying a layer of zirconium oxide and then heating the assembly to a temperature above the eutectic temperature and below the melting point of the material from which the elements are formed. The formation of a sapphire rubidium maser cell utilizing eutectic bonding is shown. NASA



25 INORGANIC AND PHYSICAL CHEMISTRY

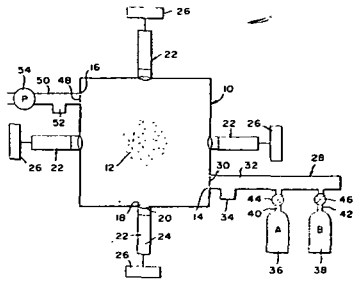
Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also *77 Thermodynamics and Statistical Physics.*

N76-17216*# National Aeronautics and Space Administration. Pasadena Office, Calif.
PHOTON EXCITED CATALYSIS Patent Application
Melvin M. Saffren, inventor (to NASA) (JPL) Filed 29 Jan. 1976 12 p
(Contract NAS7-100)
(NASA-Case-NPO-13566-1; US-Patent-Appl-SN-653316) Avail: NTIS HC $3.50 CSCL 07D

A catalytic procedure for increasing the yield of photonically initiated gas phase chemical reactions is described. The procedure involves the extraction of excess energy from unstable excited

species by contacting the species with the surface of a finely divided solid. NASA



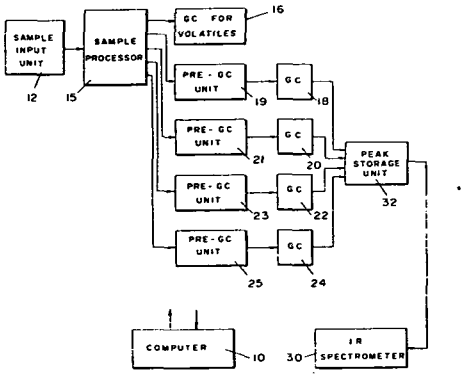
N76-18245* National Aeronautics and Space Administration. Pasadena Office, Calif.

AUTOMATED SYSTEM FOR IDENTIFYING TRACES OF ORGANIC CHEMICAL COMPOUNDS IN AQUEOUS SOLUTIONS Patent

Charles F. Campen, Jr., inventor (to NASA) (JPL) Issued 14 Jan. 1975 14 p Filed 22 Feb. 1972 Sponsored by NASA (NASA-Case-NPO-13063-1; US-Patent-3,860,393; US-Patent-Appl-SN-227977; US-Patent-Class-23-230R; US-Patent-Class-23-230M; US-Patent-Class-23-232C; US-Patent-Class-23-253R; US-Patent-Class-23-254R; US-Patent-Class-23-255R; US-Patent-Class-73-23.1; US-Patent-Class-235-151.13) Avail: US Patent Office CSCL 07D

An automated system where, under computer control, traces of organic chemical compounds in aqueous solutions are separated into a plurality of families of compounds is described. Several of the families are separated as separate extracts, dissolved in organic solvents. The volume of solvent, containing each extract, is greatly reduced in a separate pre-GC unit, to increase the ratio of extract to solvent volume. The output of each pre-GC unit is supplied to a separate gas chromatograph (GC). The elution times of the peaks, exiting the various GC's, are used in the selection of peaks of interest by the computer based on the comparison of the extract types and the elution times with elution times of known compounds. Compounds are identified by the computer based on their extract types, elution times and the spectral data from the spectrometer.

Official Gazette of the U.S. Patent Office



26 METALLIC MATERIALS

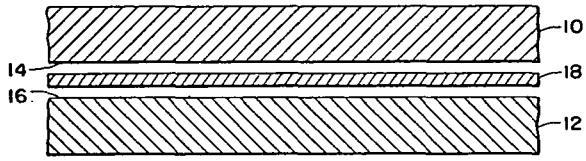
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N76-13267*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

IMPROVED BIMETALLIC JUNCTIONS Patent Application

F. G. Arcella (Westinghouse Electric Corp., Pittsburgh, Pa.), G. G. Lessmann (Westinghouse Electric Corp., Pittsburgh, Pa.), and R. A. Lindberg, inventors (to NASA) Filed 24 Oct. 1975 11 p (NASA-Case-LEW-11573-1; US-Patent-Appl-SN-625733) Avail: NTIS HC $3.50 CSCL 11D

A procedure is reported for reducing the coalescence and void growth in bimetallic welded structures exposed to high operating temperatures. The procedure involves the utilization of an alloy of the parent material in the junction of the parent material, or preannealing the junction at an ultrahigh temperature. These methods are also used to reduce the concentration gradient of a hardening agent. NASA



N76-14247*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

NICKEL BASE ALLOY Patent Application

John C. Freche and William J. Waters, inventors (to NASA) Filed 30 Dec. 1975 9 p (NASA-Case-LEW-12270-1; US-Patent-Appl-SN-645507) Avail: NTIS HC $3.50 CSCL 11F

A nickel base superalloy for use at temperatures of 2000 F (1095 C) to 2200 F (1205 C) as a stator vane material in advanced gas turbine engines is described. The alloy has a nominal composition in weight percent of 16 tungsten, 7 aluminum, 1 molybdenum, 2 columbium, 0.3 zirconium, 0.2 carbon and the balance nickel. NASA

N76-17233*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

TANTALUM MODIFIED FERRITIC IRON BASE ALLOYS Patent Application

Robert E. Oldrieve and Charles P. Blakenship, inventors (to NASA) Filed 21 Jan. 1976 10 p (NASA-Case-LEW-12095-1; US-Patent-Appl-SN-651009) Avail: NTIS HC $3.50 CSCL 11F

Improved iron based alloys with ferritic body centered cubic microstructures are reported. The alloys are of the Fe-Cr-Al type and have high temperature and oxidation resistance properties in the 800 C to 1040 C range. The application of these alloys to furnace linings and flue stacks was discussed. NASA

N76-18257* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

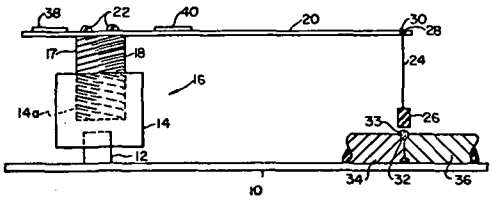
DEVICE FOR MEASURING THE FERRITE CONTENT IN AN AUSTENITIC STAINLESS-STEEL WELD Patent

Wayman N. Clotfelter and Benjamin F. Bankston, inventors (to NASA) Issued 10 Feb. 1976 5 p Filed 29 Oct. 1974 Supersedes N75-10210 (13 - 01, p 0029)

(NASA-Case-MFS-22907-1; US-Patent-3,938,037; US-Patent-Appl-SN-518546; US-Patent-Class-324-34R) Avail: US Patent Office CSCL 11F

A device is provided for measuring the ferrite content of austenitic stainless steel weld material. The device includes a base plate for rotatably mounting a mechanical vernier member, the mechanical vernier member supports a cantilever beam in a manner to provide vertical positioning of the beam. Suspended from the free end of the beam is a permanent magnet below which is positioned the specimen of austenitic weld material which is to be tested. Strain gauges are provided on the top surface of the beam for measuring the magnetic force between the magnet and weld material by measuring the amount of downward deflection of the beam. The measurement is then converted into a reading which indicates the percentage of ferrite of the weld material in the joint.

Official Gazette of the U.S. Patent Office



N76-18262*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF FORMING METAL HYDRIDE FILMS Patent Application

Robert Steinberg, Donald L. Alger, and Dale W. Cooper, inventors (to NASA) Filed 20 Feb. 1976 13 p

(NASA-Case-LEW-12083-1; US-Patent-Appl-SN-659882) Avail: NTIS HC $3.50 CSCL 11F

A method of forming a continuous, thin film of stoichiometric metal hydride such as titanium dihydride, titanium dideuteride, or titanium ditritide on a substrate which may be of metal, glass or the like is disclosed. The substrate is first cleaned, both chemically and by off-sputtering in a vacuum chamber. In an ultrahigh vacuum system vapor deposition by a sublimator or vaporizer first coats a cooled shroud disposed around the substrate with a thin film of hydride forming metal which getters any contaminant gas molecules. A shutter is then opened to allow hydride forming metal to be deposited as a film or coating on the substrate. After the hydride forming metal coating is formed, a deuterium or other hydrogen isotopes are bled into the vacuum system and diffused into the metal film or coating to form a hydride of metal film. Higher substrate temperatures and pressures may be used if various parameters are appropriately adjusted. NASA

27 NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N76-13292*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

ABRASION RESISTANT COATINGS FOR PLASTIC SURFACES Patent Application

John R. Hollahan (Tegal Corp.) and Theodore Wydeven, Jr., inventors (to NASA) (Tegal Corp.) Filed 21 Nov. 1975 13 p Sponsored by NASA

(NASA-Case-ARC-10915-1; US-Patent-Appl-SN-634304) Avail: NTIS HC $3.50 CSCL 11G

Abrasion resistant protective coatings for plastic surfaces such as acrylics, polystyrenes and polycarbonates is provided by the plasma polymerization of at least one member of a group of organosilane compounds. The compounds are selected from a group consisting of vinyltrichlorosilane, tetraethoxysilane, vinyltriethoxysilane, tetravinylsilane, vinyltriacetoxysilane, hexamethyldisilazane, tetramethylsilane, vinyldimethylethoxysilane, vinyltrimethoxysilane and methyltrimethoxysilane. Plasma polymerization of these organosilane compounds provides an abrasion resistant protective coating for plastic optical surfaces together with a uniform optically clear layer in the 4,000 to 8,000 angstrom range. The advantages of applying plasma polymerization to the present organosilane compounds is further enhanced by the utilization of an additive gas during plasma polymerization to further increase the abrasion resistance of the protective coating. NASA

N76-13293*# National Aeronautics and Space Administration. Pasadena Office, Calif.

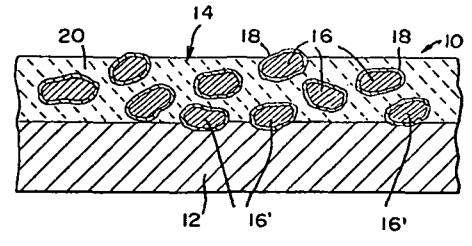
HIGH TEMPERATURE OXIDATION RESISTANT CERMET COMPOSITIONS Patent Application

Wayne M. Phillips, inventor (to NASA) (JPL) Filed 20 Nov. 1975 21 p

(Contract NAS7-100)

(NASA-Case-NPO-13666-1; US-Patent-Appl-SN-633877) Avail: NTIS HC $3.50 CSCL 11B

The production of cermet compositions for use as cermet seals in thermionic converters and diodes is described. These compositions are comprised of particles of a metal or metal alloy dispersed in a matrix of ceramic material. Composition properties include high oxidation, abrasion, and corrosion resistance, and good thermal shock resistance. The cermet compositions are particularly designed to provide high temperature resistant coatings on stainless steels or molybdenum substrates. NASA



N76-13294*# National Aeronautics and Space Administration. Pasadena Office, Calif.

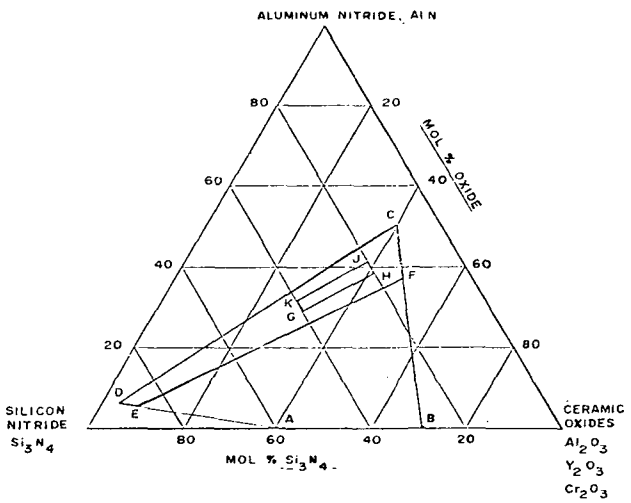
***HIGH TEMPERATURE RESISTANT CERMET AND CERAMIC COMPOSITIONS* Patent Application**

Wayne M. Phillips, inventor (to NASA) (JPL) Filed 20 Nov. 1975 28 p

(Contract NAS7-100)

(NASA-Case-NPO-13690-1; US-Patent-Appl-SN-633876) Avail: NTIS HC $4.00 CSCL 11B

The production of cermet compositions for use in thermionic converters and diodes is described. These compositions are comprised of particles of metal or metal alloys dispersed or bonded to a solid solution of the metals or its alloys. Composition qualities include high temperature oxidation, high strength and hardness, and high abrasion and wear resistance. NASA



N76-14264* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

STRAIN ARRESTOR PLATE FOR FUSED SILICA TILE Patent

Murat H. Kural, inventor (to NASA) (LMSC, Sunnyvale, Calif.) Issued 18 Nov. 1975 15 p Filed 28 Nov. 1973 Supersedes N74-15213 (12 - 06, p 0682) Sponsored by NASA

(NASA-Case-MSC-14182-1; US-Patent-3,920,339;

US-Patent-Appl-SN-419748; US-Patent-Class-428-109;

US-Patent-Class-403-28; US-Patent-Class-403-179;

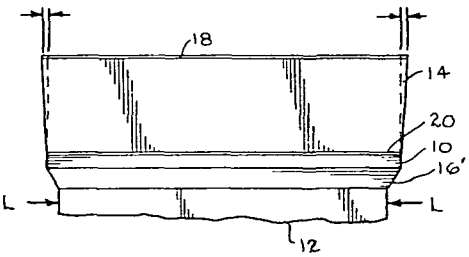
US-Patent-Class-428-214; US-Patent-Class-428-212;

US-Patent-Class-428-447; US-Patent-Class-428-77;

US-Patent-Class-428-416) Avail: US Patent Office CSCL 11A

An improvement is reported in the technique of attaching rigid thermal insulator tiles to metallic sub-panels or structural members on the exposed surfaces of spacecraft or other frameworks. Heretofore this was done by a flexible bond, but it was found that at temperatures below the glass transition range such bonds lose their flexibility and transfer more strains to the insulator tiles. Since the tiles are relatively weak and frangible, the effect of transmitted strains, whether mechanical or thermal, is cracking and spalling of the insulation material. The problem is solved by incorporation with the flexible bond, a strain arrestor plate, adjacent the insulator tile and secured to an adhesive which may be either a flexible bond or a hard bond. In addition to high strength and high stiffness, the strain arrestor plate must have a coefficient of thermal expansion preferably matching that of the rigid insulator tiles.

Official Gazette of the U.S. Patent Office



N76-15310* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

FIBER MODIFIED POLYURETHANE FOAM FOR BALLISTIC PROTECTION Patent

Richard H. Fish, John A. Parker, and Robert W. Rosser, inventors (to NASA) Issued 28 Oct. 1975 6 p Filed 19 Sep. 1973 Supersedes N74-11366 (12 - 02, p 0182)

(NASA-Case-ARC-10714-1; US-Patent-3,916,060;

US-Patent-Appl-SN-398885; US-Patent-Class-428-303;

US-Patent-Class-260-2.5AK; US-Patent-Class-427-196;

US-Patent-Class-427-426) Avail: US Patent Office CSCL 11G

The patent of an invention dealing with a fiber modified polyurethane foam for ballistic protection was presented. The substance consists of a closed cell, semi-rigid, fiber-loaded, self-extinguishing ballistic resistant foam. It has the properties of retarding penetration of incendiary ballistics, prevention of fire in the void spaces of an aircraft, providing support for the fuel cell and strengthening the airframe. The strength of the foam is enhanced by the fibers being oriented parallel to the surface of the substrate on which the foam is sprayed. The fibers should preferably be made of glass, and other materials may be added such as fire-retardant materials. Details of the chemical composition are given. Y.J.A.

N76-15311* National Aeronautics and Space Administration. Pasadena Office, Calif.

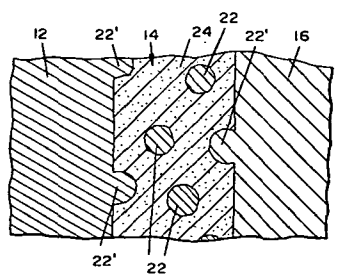
CERMET COMPOSITION AND METHOD OF FABRICATION Patent

Wayne M. Phillips, inventor (to NASA) (JPL) Issued 16 Dec. 1975 10 p Filed 5 Apr. 1973 Supersedes N73-23629 (11 - 14, p 1679) Sponsored by NASA

(NASA-Case-NPO-13120-1; US-Patent-3,926,567;

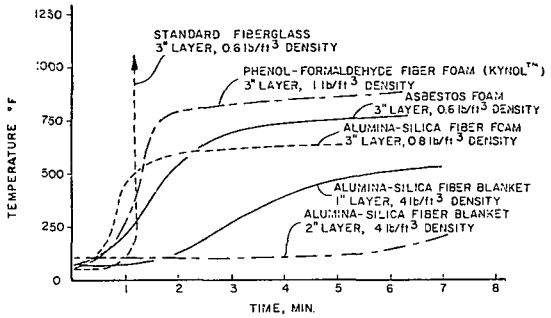
US-Patent-Appl-SN-348422; US-Patent-Class-29-182.5) Avail: US Patent Office CSCL 11B

A process for producing a cermet composition applicable as electrical insulator seals for thermionic diodes is described. Particles of a high temperature resistant metal or metal alloy are mixed with a ceramic oxide powder and vacuum sealed and sintered under high pressure in a high temperature autoclave operation. Official Gazette of the U.S. Patent Office



N76-15314*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
CERAMIC FIBER INSULATING MATERIAL AND METHODS OF PRODUCING SAME Patent Application
Rueby Y. Lin (Carborundum Co.) and Edward A. Struzik, inventor (to NASA) (Carborundum Co.) Filed 15 Dec. 1975 29 p (Contract NAS9-13641)
(NASA-Case-MSC-14795-1; US-Patent-Appl-SN-640806) Avail: NTIS HC $4.00 CSCL 11B

A method is presented of producing heat resistant, lightweight insulating nonporous foams by admixing insulating fibers such as alumina-silica fibers, phenol-formaldehyde fibers, glass fibers, or mixtures thereof with a surface active agent and soluble organic resinous binder. The mixture is then agitated to produce a stable homogenous foam. Then the foam is dewatered. The dewatered foam is heat treated to produce a dry porous, nonfluid foam. NASA



N76-16228* National Aeronautics and Space Administration. Pasadena Office, Calif.
UTILIZATION OF OXYGEN DIFLUORIDE FOR SYNTHESES OF FLUOROPOLYMERS Patent
Madeline S. Toy, inventor (to NASA) (McDonnell-Douglas Corp., Santa Monica, Calif.) Issued 6 Jan. 1976 11 p Filed 11 Jun. 1970 Supersedes N72-21100 (10 - 12, p 1566) Sponsored by NASA
(NASA-Case-NPO-12061-1; US-Patent-3,931,132; US-Patent-Appl-SN-45549; US-Patent-Class-260-92.1; US-Patent-Class-260-879; US-Patent-Class-260-900) Avail: US Patent Office CSCL 07C

The reaction oxygen difluoride, OF2, with ethylenically unsaturated fluorocarbon compounds is examined. Depending upon the fluorocarbon material and reaction conditions, OF2 can chain extend fluoropolyenes, convert functional perfluorovinyl groups to acyl fluoride and/or epoxide groups, and act as a monomer for an addition type copolymerization with diolefins.
Official Gazette of the U.S. Patent Office

N76-16229* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FUSED SILICIDE COATINGS CONTAINING DISCRETE PARTICLES FOR PROTECTING NIOBIUM ALLOYS Patent
Salvatore J. Grisaffe and Stanley R. Levine, inventors (to NASA) Issued 6 Jan. 1976 4 p Filed 4 May 1973 Supersedes N73-22474 (11 - 13, p 1540)
(NASA-Case-LEW-11179-1; US-Patent-3,931,447; US-Patent-Appl-SN-357312; US-Patent-Class-428-450; US-Patent-Class-29-195A; US-Patent-Class-427-203; US-Patent-Class-427-204; US-Patent-Class-427-205; US-Patent-Class-427-270; US-Patent-Class-427-275; US-Patent-Class-427-287; US-Patent-Class-428-457; US-Patent-Class-428-469; US-Patent-Class-428-539) Avail: US Patent Office CSCL 11G

Fused silicide coatings for protecting niobium alloy substrates are modified by providing dispersed nucleation sites in the form of discrete particles in the coating. The discrete particles have a thermal expansion coefficient lower than that of the fused silicide material. This alters the microstructure and reduces the thermal expansion coefficient of the coating so as to minimize the number of tensile cracks. Official Gazette of the U.S. Patent Office

N76-16230* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TRANSPARENT FIRE RESISTANT POLYMERIC STRUCTURES Patent
George M. Fohlen, John A. Parker, and Paul M. Sawko, inventors (to NASA) Issued 23 Dec. 1975 8 p Filed 29 Jan. 1974 Supersedes N74-16249 (12 - 07, p 0812)
(NASA-Case-ARC-10813-1; US-Patent-3,928,708; US-Patent-Appl-SN-437556; US-Patent-Class-428-412; US-Patent-Class-264-331; US-Patent-Class-428-413; US-Patent-Class-428-447; US-Patent-Class-428-920; US-Patent-Class-428-921; US-Patent-Class-428-911) Avail: US Patent Office CSCL 11D

Transparent impact-, heat- and fire-resistant polymeric materials for making windows, windshields and plane canopies are provided; the polymeric materials comprise and exposy resin cured with an alkoxy boroxine catalyst and a polycarbonate resin, preferably a polyphenolphthalein carbonate resin. The laminates, including the advantages of both resins, comprise a transparent layer of epoxy resin and a transparent layer of a polycarbonate resin joined together with a transparent adhesive interlayer.
Official Gazette of the U.S. Patent Office

28 PROPELLANTS AND FUELS

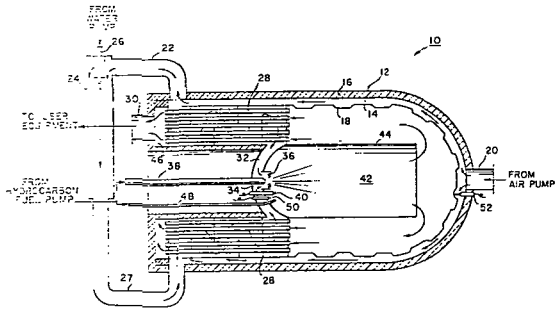
Includes rocket propellants, igniters, and oxidizers, storage and handling; and aircraft fuels.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

N76-16241*# National Aeronautics and Space Administration. Pasadena Office, Calif.
IMPROVED HYDROGEN-RICH GAS GENERATOR Patent Application
John Houseman, inventor (to NASA) (Calif. Inst. of Tech., Pasadena) Filed 27 Dec. 1975 22 p Sponsored by NASA (NASA-Case-NPO-13464-2; US-Patent-Appl-SN-553687) Avail: NTIS HC $3.50 CSCL 21D

A process and apparatus are described for producing a

hydrogen rich gas from liquid hydrocarbon and water using the partial oxidation steam reforming process. NASA



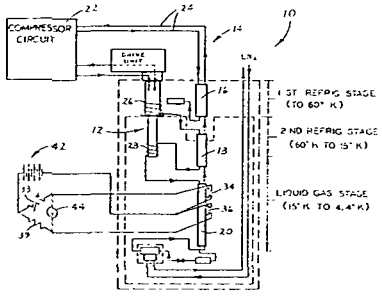
31 ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; and cryogenics.

N76-14284* National Aeronautics and Space Administration. Pasadena Office, Calif.
HELIUM REFRIGERATOR Patent
Ervin R. Wiebe, inventor (to NASA) (JPL) Issued 28 Oct. 1975 5 p Filed 12 Jun. 1974 Supersedes N74-28134 (12 - 17, p 2071) Sponsored by NASA
(NASA-Case-NPO-13435-1; US-Patent-3,914,950; US-Patent-Appl-SN-478803; US-Patent-Class-62-49; US-Patent-Class-62-129; US-Patent-Class-73-295) Avail: US Patent Office CSCL 20L

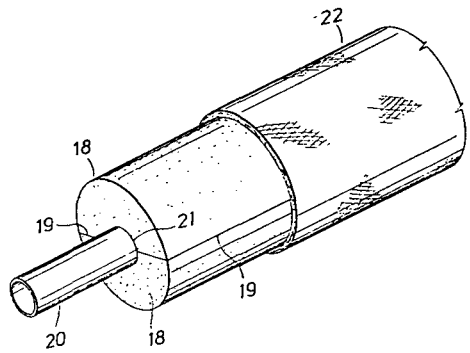
An improved helium refrigerator, which includes a means for providing a continuous signal indicative of the reserve cooling capacity of the refrigerator, is disclosed.

Official Gazette of the U.S. Patent Office



N76-16245*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
INSULATION FOR PIPING Patent Application
Guillermo Lerma, inventor (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Filed 23 Dec. 1975 14 p
(Contract NAS9-14000)
(NASA-Case-MSC-19523-1; US-Patent-Appl-SN-643895) Avail: NTIS HC $3.50 CSCL 11G

A foamed insulation for cryogenic pipe lines comprised of a pair of preformed, semicircular foamed insulation half-sections is described. The faying surfaces are coated with a polyurethane adhesive and bonded together about the pipe. The faying surfaces of the pipe and inner radii of the half-sections are not bonded together. The ends of the foamed insulation half-sections are tapered and a knitted outer material is stretched over the pipe, the tapered ends, and the body of the mated half-sections and extends over the pipe beyond each tapered end. A polyurethane resin coating is applied to the knitted outer material to form a seal and prevent air circulation through the half-sections and provide abrasion resistance. A process of insulating a cryogenic pipe line and a process for forming the preformed insulation half-sections is also described. NASA



32 COMMUNICATIONS

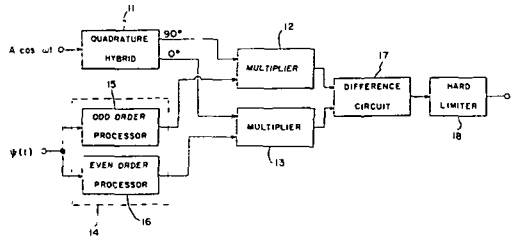
Includes land and global communications; communications theory; and optical communications.

For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

N76-10356*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PHASE MODULATOR Patent Application
Chase P. Hearn, inventor (to NASA) Filed 29 Sep. 1975 17 p
(NASA-Case-LAR-11607-1; US-Patent-Appl-SN-617895) Avail: NTIS HC $3.25 CSCL 17B

Method and apparatus are presented for producing a phase-modulated waveform having a high degree of linearity between the modulating signal and the phase of the modulated carrier signal. Two signals representing finite odd and even power series transformations of the modulating signal are produced and multiplied with two quadrature components of the input carrier signal, respectively. One of the multiplied signals is subtracted from the other and the resulting signal is hard-limited to produce a phase-modulated output signal. The means for producing the two signals representing the odd and even power series of the modulating signal includes means for varying the coefficients of the two power series. By means of an existing

computer program, the coefficients of the two power series are selected such that there is an extremely high degree of linearity between the modulating signal and the phase of the modulated carrier signal. NASA

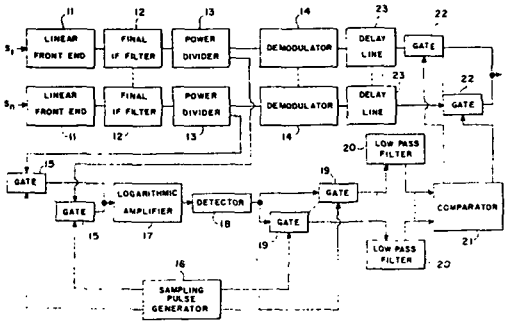


N76-14321* *National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.*

MULTICHANNEL LOGARITHMIC RF LEVEL DETECTOR Patent

Chase P. Hearn and Curtis L. Shriver, inventors (to NASA) Issued 28 Oct. 1975 6 p Filed 20 Mar. 1974 Supersedes N74-20019 (12 - 11, p 1290)
(NASA-Case-LAR-11021-1; US-Patent-3,916,316;
US-Patent-Appl-SN-453115; US-Patent-Class-325-304;
US-Patent-Class-325-306; US-Patent-Class-325-372;
US-Patent-Class-328-145; US-Patent-Class-343-176) Avail: US Patent Office CSCL 17B

The invention is a logarithmic RF level detector which can be used to derive gain-weighting signals in an n-channel angle modulation diversity receiving system. The IF signals are sequentially gated into a single logarithmic IF amplifier which compresses the input signal dynamic range by a factor on the order of a hundred to one. The amplifier output signal is detected and then gated back into the n-channels simultaneously with the gating of the signals into the logarithmic amplifier. After being gated back into its channel each signal feeds a low pass filter which passes only the low pass, or zeroth order zone. The signals so derived may then used to actuate a diversity combination operation. *Official Gazette of the U.S. Patent Office*

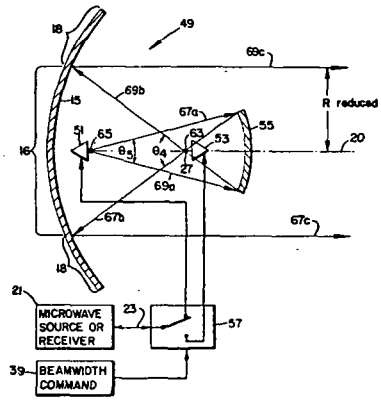


N76-15329* *National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.*

SINGLE FREQUENCY, TWO FEED DISH ANTENNA HAVING SWITCHABLE BEAMWIDTH Patent

Richard F. Schmidt, inventor (to NASA) Issued 16 Dec. 1975 6 p Filed 4 Oct. 1974 Supersedes N74-34649 (12 - 24, p 2922
(NASA-Case-GSC-11968-1; US-Patent-3,927,408;
US-Patent-Appl-SN-512825; US-Patent-Class-343-779;
US-Patent-Class-343-837; US-Patent-Class-343-876) Avail: US Patent Office CSCL 17B

A switchable beamwidth antenna is described which includes a concave parabolic main reflecting dish which has a central circular region and a surrounding coaxial annular region. A feed means selectively excites only the central region of the main dish via a truncated subreflector for wide beamwidth or substantially the entire main dish for narrow beamwidth. In the embodiment shown, the feed means comprises a truncated concave ellipsoid subreflector and separate feed terminations located at two foci of the ellipsoid. One feed termination directly views all of the main dish while the other feed termination, exciting the main dish via the subreflector, excites only the central region because of the subreflector truncation.
Official Gazette of the U.S. Patent Office



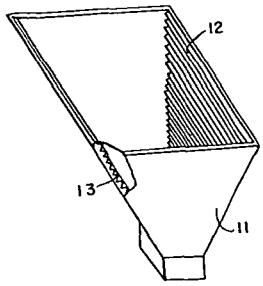
N76-15330* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

HORN ANTENNA HAVING V-SHAPED CORRUGATED SLOTS Patent

Leon Peters, Jr. (Ohio State Univ.) and Carl A. Mentzer, inventors (to NASA) (Ohio State Univ.) Issued 2 Dec. 1975 4 p Filed 24 Jul. 1974 Supersedes N74-29575 (12 - 19, p 2258) Sponsored by NASA
(NASA-Case-LAR-11112-1; US-Patent-3,924,237;
US-Patent-Appl-SN-491419; US-Patent-Class-343-786) CSCL 17B

A corrugated horn antenna is disclosed in which the corrugated surfaces of the antenna are formed by V-shaped slots. The depth of the slots in between 0.3125 and 0.625 wavelengths. For this range of depths the surface impedance is capacitive and operates in a cut-off mode. The V-shaped corrugated slots are more easily machined than previous slots, and the resulting

antenna is readily adaptable to unfurlable antennas for space applications. Official Gazette of the U.S. Patent Office



N76-16249* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

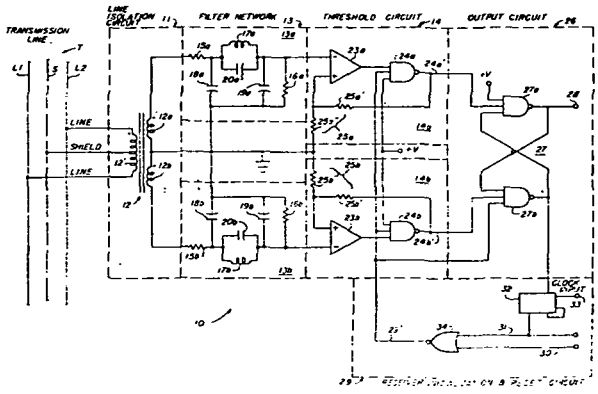
LOW DISTORTION RECEIVER FOR BI-LEVEL BASEBAND PCM WAVEFORMS Patent

George E. Proch, inventor (to NASA) (Lockheed Electronics Co., Inc., Houston, Tex.) Issued 2 Dec. 1975 10 p Filed 26 Apr. 1974 Continuation-in-part of US Patent Appl. SN-428994, filed 27 Dec. 1973 Sponsored by NASA

(NASA-Case-MSC-14557-1; US-Patent-3,924,068; US-Patent-Appl-SN-464720; US-Patent-Class-178-88; US-Patent-Class-178-69C; US-Patent-Class-325.321; US-Patent-Appl-SN-428994) Avail: US Patent Office CSCL 17B

An improved low distortion asynchronous receiver, designed to receive balanced differential signals from a transmission line, recover and reconstruct a positive logic level signal from the received signals, and supply a suitable unipolar pulse code modulated (pcm) output waveform to a conventional sync detector/data decoder for further processing is disclosed. A hybrid transformer couples the differential signals appearing on the transmission line into the receiver as a double-ended input referenced to the receiver ground. Each of the two signals is applied to a separate low pass filter network to provide a standard waveform transition characteristic. Each filtered signal is supplied to a threshold detection circuit comprising a differential comparator, a NAND gate and a voltage divider network. The detection circuit provides a stable threshold level for converting the filtered line signal to positive logic levels.

Official Gazette of the U.S. Patent Office



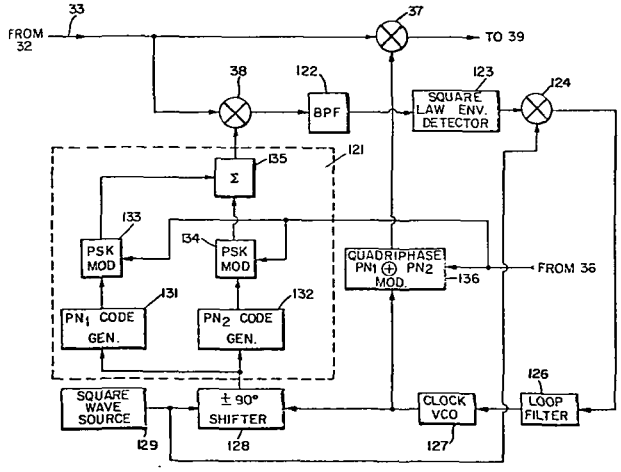
N76-16302*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

PSEUDO NOISE CODE AND DATA TRANSMISSION METHOD AND APPARATUS Patent Application

Leonard F. Deerkoski, inventor (to NASA) Filed 30 Dec. 1975 30 p

(NASA-Case-GSC-12017-1; US-Patent-Appl-SN-645510) Avail: NTIS HC $4.00 CSCL 17B

A data transmission system is described in which pseudo noise ranging codes and a pair of binary data sources digitally modulate a suppressed carrier wave having a first frequency. Two additional binary data sources, digitally modulate a suppressed carrier wave having a second frequency. The first and second frequencies are only slightly displaced so that the frequency bands which modulate the two carriers overlap. The two suppressed carrier waves are linearly combined and transmitted so that the amplitude of the first wave does not degrade the detectability of the second. The information modulated on the second carrier is coherently detected to recover both signals. The signals modulated on the first carrier are recovered by a pair of matched filters. The two derived pseudo noise codes are mixed with the received signal to increase the amplitudes of the two data sources modulating the first wave above the amplitude of the second wave. NASA



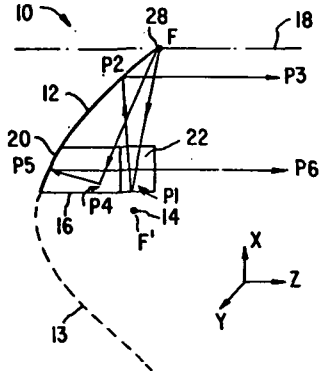
N76-18295* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

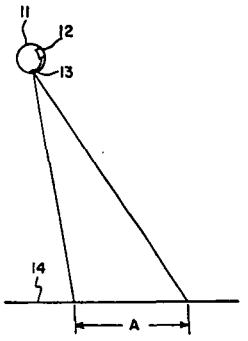
VARIABLE BEAMWIDTH ANTENNA Patent

Richard F. Schmidt, inventor (to NASA) Issued 10 Feb. 1976 11 p Filed 27 Aug. 1974 Supersedes N74-32674 (12-22, p 2667)

(NASA-Case-GSC-11862-1; US-Patent-3,938,162; US-Patent-Appl-SN-500979; US-Patent-Class-343-840; US-Patent-Class-343-837; US-Patent-Class-343-912; US-Patent-Class-343-915) Avail: US Patent Office CSCL 17B

An antenna system for single or plural beams is described, providing continuously variable beamwidth selectively in one or both of two orthogonal senses, i.e., azimuth and elevation, for either communications or angle-tracking. The system includes two parabolic cylindrical reflectors, which are respectively a main reflector and a sub-reflector; the reflectors are positioned with the focal axes. A point or multibeam (e.g. monopulse) feed is mounted adjacent the main reflector on the focal axis of the sub reflector. Beamwidth is controlled using telescoping sections on the main and sub reflectors to control the size of the surface areas. Official Gazette of the U.S. Patent Office





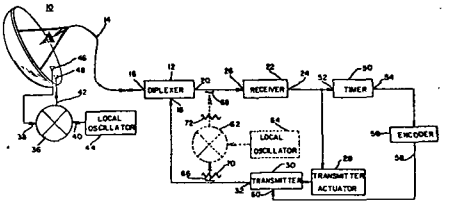
N76-19318*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

AUTOMATIC TRANSPONDER Patent Application

Roy E. Anderson (GE, Schenectady, N. Y.) and James R. Lewis, inventors (to NASA) (GE, Schenectady, N. Y.) Filed 27 Mar. 1976 23 p Sponsored by NASA

(NASA-Case-GSC-12075-1; US-Patent-Appl-SN-562499) Avail: NTIS HC $3.50 CSCL 17B

A method and apparatus for the automatic, remote measurement of the internal delay time of a transponder at the time of operation is provided. A small portion of the transmitted signal of the transponder is converted to the receive signal frequency of the transponder and supplied to the input of the transponder. The elapsed time between the receive signal locally generated and the receive signal causing the transmission of the transmitted signal is measured, said time being representative of or equal to the internal delay time of the transponder at the time of operation. NASA



N76-18315*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

METHOD OF LOCATING PERSONS IN DISTRESS Patent Application

Wilford E. Sivertson, Jr., inventor (to NASA) Filed 27 Feb. 1976 9 p

(NASA-Case-LAR-11390-1; US-Patent-Appl-SN-662176) Avail: NTIS HC $3.50 CSCL 17B

A method is presented for locating any person in distress in a selected area on the surface of the earth who has deployed passive radio frequency (RF) reflectors in a predetermined arrangement. A first transparency is made in the spatial frequency domain of an image of the predetermined arrangement of the RF reflectors. The selected area of the surface of the earth is scanned by means of a side-looking radar, on board a satellite or aircraft, to produce radar images. Second transparencies in the conventional image domain are produced from the radar images. It is then determined from the first and second transparencies, by means of complex spatial filtering, if RF reflectors in the predetermined arrangement were deployed in the selected area when scanned by the radar. NASA

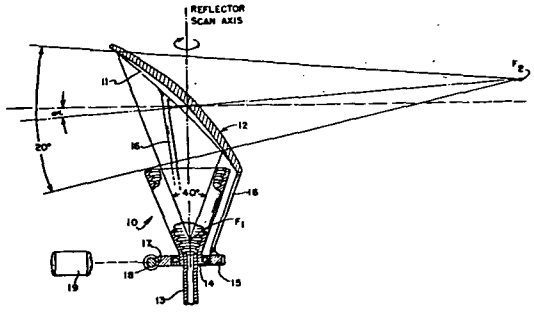
N76-21365* National Aeronautics and Space Administration. Pasadena Office, Calif.

HIGHLY EFFICIENT ANTENNA SYSTEM USING A CORRUGATED HORN AND SCANNING HYPERBOLIC REFLECTOR Patent

Kenneth A. Green, inventor (to NASA) (Microwave Res. Corp.) Issued 6 Apr. 1976 8 p Filed 19 Dec. 1974 Supersedes N75-14964 (13 - 06, p 0649) Sponsored by NASA

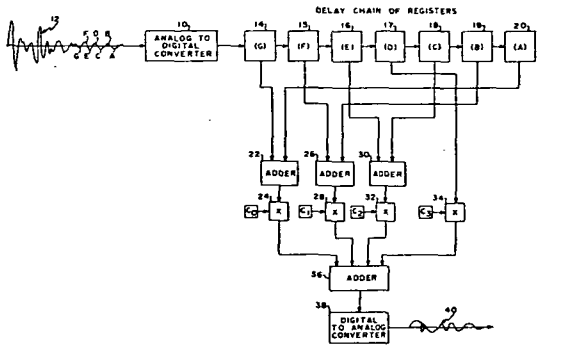
(NASA-Case-NPO-13568-1; US-Patent-3,949,404; US-Patent-Appl-SN-534265; US-Patent-Class-343-761; US-Patent-Class-343-781; US-Patent-Class-343-786) Avail: US Patent Office CSCL 17B

In a horn-reflector antenna system for producing a spherical aperture phase front, a corrugated conical horn illuminates a section of a hyperbolic reflector to produce a spherical aperture phase front. This front produces a far field beam with low sidelobes and high beam efficiency. The system is insensitive to frequency and polarization changes, and is also insensitive to orientation about the axis of the conical horn for beam scanning. Official Gazette of the U.S. Patent Office



N76-21366* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
FILTERING DEVICE Patent
Thomas R. Edwards and Hugh W. Zeanah, inventors (to NASA) Issued 6 Apr. 1976 4 p Filed 17 Dec. 1974 Supersedes N75-14011 (13 - 05, p 0523)
(NASA-Case-MFS-22729-1; US-Patent-3,949,206; US-Patent-Appl-SN-533608; US-Patent-Class-235-156; US-Patent-Class-325-42; US-Patent-Class-333-18) Avail: US Patent Office CSCL 17B

An electrical filter for removing noise from a voice communications signal is reported; seven sample values of the signal are obtained continuously, updated and subjected to filtering. Filtering is accomplished by adding balanced, with respect to a mid-point sample, spaced pairs of the sampled values, and then multiplying each pair by a selected filter constant. The signal products thus obtained are summed to provide a filtered version of the original signal. Official Gazette of the U.S. Patent Office



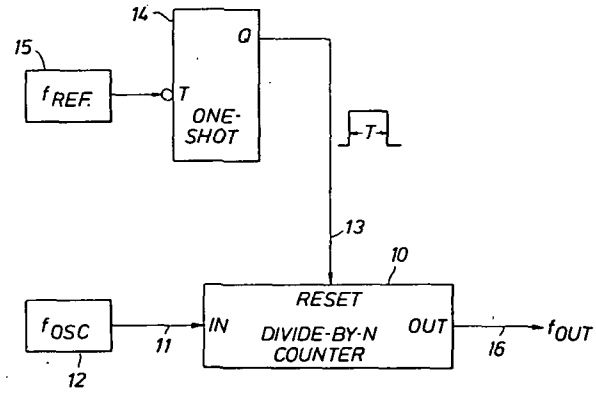
33 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics*.

N76-13377*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
OPEN LOOP DIGITAL FREQUENCY MULTIPLIER Patent Application
Robert C. Moore, inventor (to NASA) (Johns Hopkins Univ.) Filed 10 Nov. 1975 9 p Sponsored by NASA
(NASA-Case-MSC-12709-1; US-Patent-Appl-SN-630583) Avail: NTIS HC $3.50 CSCL 09C

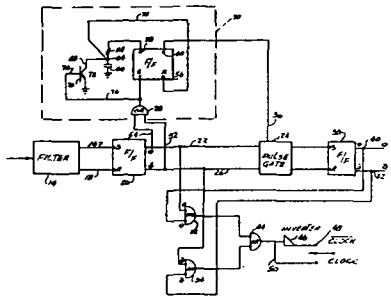
An open loop digital frequency multiplier with a multiplied output synchronized to low frequency clock pulses is described. The system includes a multi-stage digital counter which provides a pulse output as a function of an integer divisor. The integer divisor and the timing or counting cycle of the counter are interrelated to the frequency of a clock input. The counting cycle is controlled by a one-shot multivibrator which, in turn, is driven by a reference frequency input. NASA



N76-14371* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
COMPACT-BI-PHASE PULSE CODED MODULATION DECODER Patent
Pierce C. Toole, inventor (to NASA) Issued 28 Oct. 1975 4 p Filed 26 Dec. 1974
(NASA-Case-KSC-10834-1; US-Patent-3,916,084; US-Patent-Appl-SN-536535; US-Patent-Class-178-69.5R; US-Patent-Class-178-88; US-Patent-Class-328-63; US-Patent-Class-328-190) Avail: US Patent Office CSCL 09A

An apparatus is described for extracting and generating a clock pulse train from a pulse coded data train. The apparatus includes a filter circuit for receiving the pulse coded data train, and a first set-reset flip-flop is provided for receiving the signals from the pulse coded train. Coupled to the output of the first flip-flop is a means for generating a triggering pulse responsive to the occurrence of data within the train. A pulse gate is activated

by the triggering pulse for causing the data from the pulse coded data train to be stored in a second flip-flop. A clock pulse generating means is coupled between the outputs of the first and second flip-flops for generating a continuous stream of clock pulses which are synchronized with the incoming-pulse coded data train. Official Gazette of the U.S. Patent Office



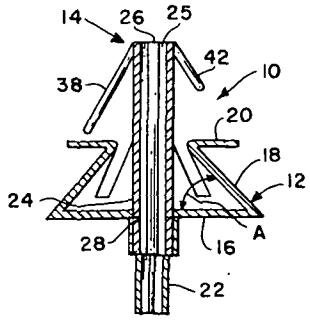
N76-14372* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

TURNSTILE AND FLARED CONE UHF ANTENNA Patent

Donald J. Bottoms (Martin Marietta Corp., Denver) and Theofanis G. Gavrillis, inventors (to NASA) (Martin Marietta Corp., Denver) Issued 11 Nov. 1975 5 p Filed 27 Nov. 1974 Supersedes N75-13125 (13 - 04, p 0405) Sponsored by NASA (NASA-Case-LAR-10970-1; US-Patent-3,919,710; US-Patent-Appl-SN-527790; US-Patent-Class-343-770; US-Patent-Class-343-797; US-Patent-Class-343-846) Avail: US Patent Office CSCL 09C

An improvement to the turnstile-cup antenna is described which increases its beamwidth. The improved beamwidth characteristics are attained by tilting the turnstile arms toward slots contained in a truncated cone.

Official Gazette of the U.S. Patent Office



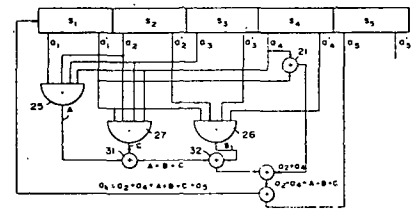
N76-14373* National Aeronautics and Space Administration. Pasadena Office, Calif.

NONLINEAR NONSINGULAR FEEDBACK SHIFT REGISTERS Patent

Martin Perlman, inventor (to NASA) (JPL) Issued 7 Oct. 1975 18 p Filed 27 Aug. 1974 Supersedes N74-32648 (12 - 22, p 2663) Sponsored by NASA (NASA-Case-NPO-13451-1; US-Patent-3,911,330; US-Patent-Appl-SN-501012; US-Patent-Class-328-37; US-Patent-Class-307-221R; US-Patent-Class-235-92SH) Avail: US Patent Office CSCL 09C

Four classes of nonlinear nonsingular feedback shift registers (NLFSR) are disclosed. Each NLFSR is assumed to be r stages long and regardless of its class, generates a feedback sequence of length 2r. Each NLFSR of either class 1 or class 2 has a feedback arrangement which is a function of a primative polynomial of degree r-1. Each register of class 1 includes three nonlinear terms, each one of which is the AND function of a different combination of (r-1) outputs of the first (r-1) stages. Each register of class 2 includes a single nonlinear term which is the AND function of (r-1) outputs of the first (r-1) stages. Each NLFSR in class 3 has a feedback arrangement which is based on a primative polynomial of degree r-2 and a unique single nonlinear term, while each NLFSR in class 4 has a feedback arrangement which is based on a primitive polynomial of degree r-3 and three nonlinear terms.

Official Gazette of the U.S. Patent Office



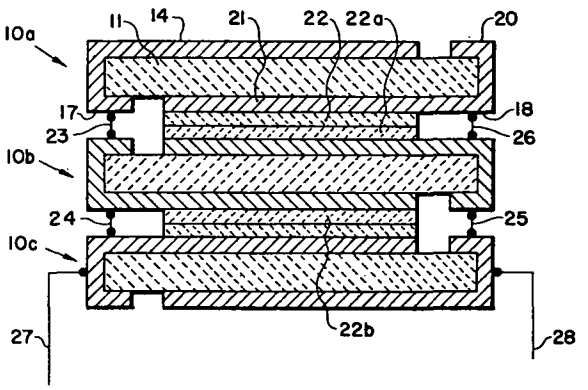
N76-15373* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HIGH TEMPERATURE BERYLLIUM OXIDE CAPACITOR Patent

Russell A. Lindberg, inventor (to NASA) Issued 2 Dec. 1975 4 p Filed 28 Jan. 1975 Supersedes N75-16746 (13 - 08, p 0878) (NASA-Case-LEW-11938-1; US-Patent-3,924,164; US-Patent-Appl-SN-544611; US-Patent-Class-317-258; US-Patent-Class-317-261) Avail: US Patent Office CSCL 09A

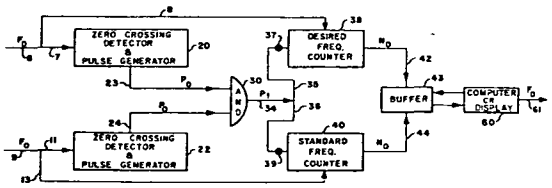
A capacitor suitable for use in environments where the temperature is as high as 1500 C is described. The capacitor is comprised of a BeO wafer which is off-sputtered on each side and an electrode of Iridium on each side which is deposited by sputtering, or ion plating. A barrier layer of BeO is deposited on one or both of the electrodes to prevent diffusion bonding of

the electrodes of adjacent capacitors due to temperature, pressure, and vacuum when several capacitors are stocked.
Official Gazette of the U.S. Patent Office



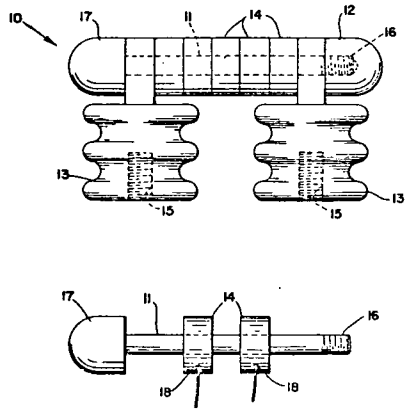
N76-16331* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
FREQUENCY MEASUREMENT BY COINCIDENCE DETECTION WITH STANDARD FREQUENCY Patent
Edward J. Nossen (RCA, Princeton, N. J.) and Eugene R. Starner, inventors (to NASA) (RCA, Princeton, N. J.) Issued 2 Dec. 1975 4 p Filed 13 Sep. 1974 Supersedes N75-13124 (13 - 04, p 0405) Sponsored by NASA
(NASA-Case-MSC-14649-1; US-Patent-3,924,183;
US-Patent-Appl-SN-505819; US-Patent-Class-324-79D;
US-Patent-Class-328-134) Avail: US Patent Office CSCL 09C

A method of measuring a desired frequency by comparing it with a standard frequency is disclosed. The zero crossings of both frequencies are detected. A command pulse is generated at each coincidence and is used to start and stop a pair of frequency counters adapted to count the desired and standard frequencies. A measure of the desired frequency is obtained by multiplying the known standard frequency by the ratio between the desired count and the standard count obtained in the two frequency counters. Official Gazette of the U.S. Patent Office



N76-16332* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
HIGH VOLTAGE DISTRIBUTOR Patent
James F. McChesney, Jr., inventor (to NASA) Issued 6 Jan. 1976 4 p Filed 15 May 1974 Supersedes N74-22873 (12 - 14, p 1654)
(NASA-Case-GSC-11849-1; US-Patent-3,931,456;
US-Patent-Appl-SN-470428; US-Patent-Class-174-145;
US-Patent-Class-174-148; US-Patent-Class-339-143C;
US-Patent-Class-339-198R; US-Patent-Class-339-242;
US-Patent-Class-339-275R) Avail: US Patent Office CSCL 09A

A high voltage distributor which allows the easy connection and disconnection of a high voltage power supply to and from one or more circuits requiring the supply is described. The design configuration features unrestrained pump-out, insulation of the high voltage from ground, and freedom from corona. These features are obtained by mounting a removable retaining rod on one or more insulators, thereby facilitating the support by the retaining rod of a plurality of washers. One of the washers is integrally connected to the high voltage power supply while the remaining washers are integrally connected to the circuits requiring the high voltage. Official Gazette of the U.S. Patent Office

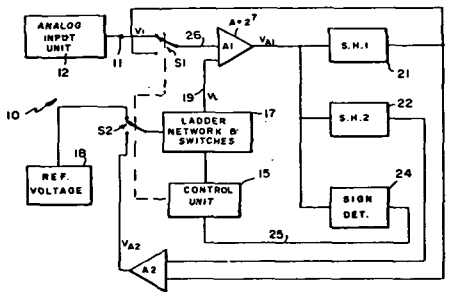


N76-18345* National Aeronautics and Space Administration. Pasadena Office, Calif.
ANALOG TO DIGITAL CONVERTER Patent
Charles H. Lucas, inventor (to NASA) Issued 10 Feb. 1976 11 p Filed 27 Aug. 1974 Supersedes N74-32646 (12 - 22, p 2663) Sponsored by NASA
(NASA-Case-NPO-13385-1; US-Patent-3,938,188;
US-Patent-Appl-SN-501011; US-Patent-Class-340-347AD)
Avail: US Patent Office CSCL 09C

An analog-to-digital converter, finding particular application in a multichannel pulse height analyzer, includes means for digitizing the analog input in two conversion steps. To digitize the input to 13 bits, a 7-bit digital to analog converter with a 7-bit up-down counter is used. During the first conversion step which is a coarse conversion, the input V sub i is compared with the DAC output, V sub I and the 7-bits of the counter are set by successive approximation. Thereafter the DAC output is driven twice toward V sub i. The output of an amplifier is stored after each change of the DAC in one of two storage and hold circuits, depending on the polarity of the amplifier output. Then, the content of the 7-bit counter is transferred to the 7 higher

order bits of a 14-bit buffer counter. The fine conversion step is performed by successive approximation.

Official Gazette of the U.S. Patent Office

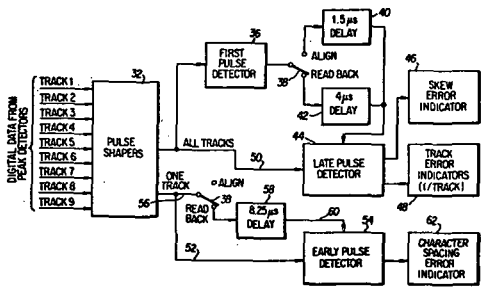


N76-18353* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

AUTOMATIC CHARACTER SKEW AND SPACING CHECKING NETWORK Patents

Robert T. McKenna, inventor (to NASA) 10 Feb. 1976 8 p Filed 6 Jan. 1975 Supersedes N75-16792 (13 - 08, p 0884) (NASA-Case-GSC-11925-1; US-Patent-3,938,182; US-Patent-Appl-SN-538983; US-Patent-Class-360-26; US-Patent-Class-360-51) Avail: US Patent Office CSCL 09C

A network is disclosed for automatically checking the skew and character spacing of digital tape drive systems to indicate out-of-tolerance conditions of those parameters. The network enables a tape drive to check its own recording accuracy as well as that of tapes recorded on other drives. In operation, the first detected pulse of each character triggers a monostable multi-vibrator which locks out further data pulses and initiates a window pulse equal in length to the maximum permissible skew. At the end of the window pulse data pulses may again be received. If a pulse is received after termination of the window pulse, the skew is determined to exceed specifications and a skew error indication is given by the illumination of display light. A similar circuit arrangement is provided for detecting character spacing which is less than the minimum required for unambiguous data reproduction. Official Gazette of the U.S. Patent Office



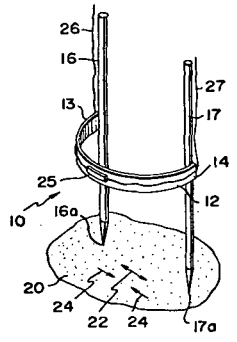
N76-19338* National Aeronautics and Space Administration. Pasadena Office, Calif.

MINIATURE MUSCLE DISPLACEMENT TRANSDUCER Patent

Cyril Feldstein (JPL), Jules V. Osher (JPL), Gilbert W. Lewis (JPL), Robert H. Silver (JPL), and Edward N. Duran, inventors (to NASA) (JPL) Issued 10 Feb. 1976 5 p Filed 27 Dec. 1974 Supersedes N75-17102 (13 - 08, p 0923) Sponsored by NASA (NASA-Case-NPO-13519-1; US-Patent-3,937,212; US-Patent-Appl-SN-536761; US-Patent-Class-128-2S; US-Patent-Class-33-155R; US-Patent-Class-33-174D; US-Patent-Class-73-88.5SD) Avail: US Patent Office CSCL 09A

The miniature transducer for sensing muscle displacement substantially consists of a curved beam of high elastic compliance connected at its ends to two prongs. The prongs have sharpened tips which are insertable into the muscle. A sensitive strain gauge is bonded to the beam preferably at the point of greatest curvature. The strain gauge output is directly related to changes in the beam curvature. As the muscle expands, the spacing between the prongs increases which decreases the beam curvature. On the other hand, when the muscle contracts the prongs' spacing decreases, thereby increasing the beam curvature.

Official Gazette of the U.S. Patent Office



N76-19339* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

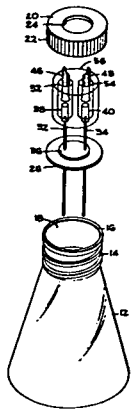
ELECTRICAL CONDUCTIVITY CELL AND METHOD FOR FABRICATING THE SAME Patent

William P. Gilbreath (Foothill Coll.), Michael J. Adamson (Foothill Coll.), and Alexander G. Fassbender, inventors (to NASA) (Foothill Coll.) Issued 10 Feb. 1976 5 p Filed 16 Jul. 1974 Supersedes N74-29772 (12 - 19, p 2282) Sponsored by NASA (NASA-Case-ARC-10810-1; US-Patent-3,938,035; US-Patent-Appl-SN-489009; US-Patent-Class-324-30B; US-Patent-Class-204-195R; US-Patent-Class-215-247) Avail: US Patent Office CSCL 09C

A flask having a threaded neck and a cap adapted for threaded engagement on the neck are used. A laminated disc between the cap and the neck forms a gas tight seal and the cap has a central opening that exposes a medial region of the disc. Piercing the disc through the opening are two electrodes, the inner ends of which contact the sample within the flask and the outer ends of which can be connected to test equipment. Cylindric glass tubes are fitted over the external portion of the electrodes to provide physical support and silicone rubber or a similar material serves to retain the glass cylinders in place and form a gas tight seal between the cylinders and the electrodes. Shrinkable tubing is shrunk over the glass tubes to afford further mechanical support and sealing. A final relatively large diameter shrinkable tube is shrunk over both electrodes and their associated glass

cylinders. The support and sealing means for the electrodes is confined to a limited portion of the medial region of the disc so that the remainder of such region can be punctured by a hollow needle to introduce a test sample within the flask.

Official Gazette of the U.S. Patent Office



N76-21390* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

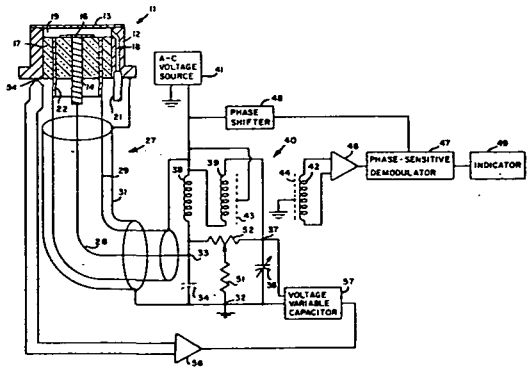
TRIELECTRODE CAPACITIVE PRESSURE TRANSDUCER Patent

Grant W. Coon, inventor (to NASA) Issued 6 Apr. 1976 13 p Filed 17 Jul. 1975 Supersedes N75-29320 (13 - 20, p 2512) Division of abandoned US Patent Appl. SN-493363, filed 31 Jul. 1974

(NASA-Case-ARC-10711-2; US-Patent-3,948,102; US-Patent-Appl-SN-596788; US-Patent-Class-73-398C; US-Patent-Class-317-246; US-Patent-Appl-SN-493363) Avail: US Patent Office CSCL 09A

A capacitive transducer and circuit especially suited for making measurements in a high-temperature environment are described. The transducer includes two capacitive electrodes and a shield electrode. As the temperature of the transducer rises, the resistance of the insulation between the capacitive electrode decreases and a resistive current attempts to interfere with the capacitive current between the capacitive electrodes. The shield electrode and the circuit coupled there reduce the resistive current in the transducer. A bridge-type circuit coupled to the transducer ignores the resistive current and measures only the capacitive current flowing between the capacitive electrodes.

Official Gazette of the U.S. Patent Office



34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

N76-13419*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

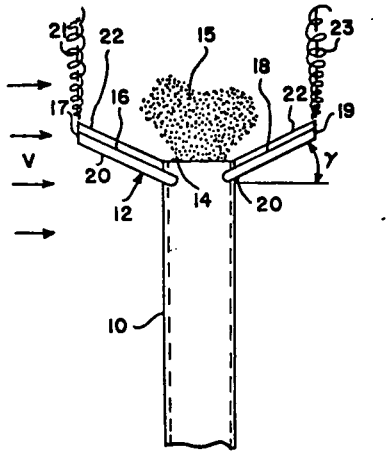
SMOKESTACK MOUNTED AIRFOIL Patent Application

Robert C. Costen, inventor (to NASA) Filed 10 Nov. 1975 25 p

(NASA-Case-LAR-11669-1; US-Patent-Appl-SN-630582) Avail: NTIS HC $3.50 CSCL 20D

A system is described for improving the effluent dispersal characteristics of smokestacks subject to relative winds; the system consists of a vortex generating airfoil attached to a smokestack near the stack gas exit. Relative winds passing over the airfoil create strong vortices which entrain and hold together smokestack effluents until the vortices deteriorate. The vortex flow direction and angle of ascension may be controlled in order to achieve optimum effluent dispersal by varying the airfoil angle of attack.

NASA



N76-14418*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

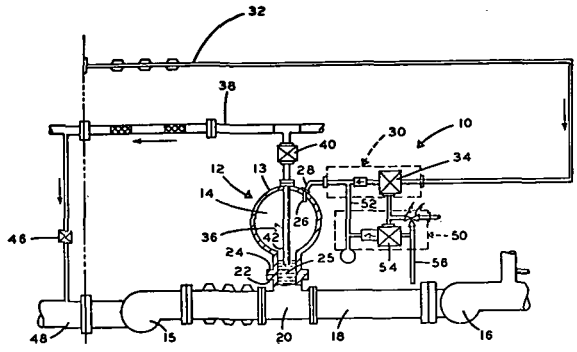
AN IMPROVED ACCUMULATOR Patent Application

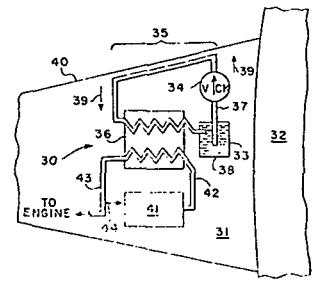
James R. Fenwick (Rocketdyne, Canoga Park, Calif.) and George H. Karigan, inventors (to NASA) (Rocketdyne, Canoga Park, Calif.) Filed 18 Dec. 1975 11 p. Sponsored by NASA

(NASA-Case-MFS-19287-1; US-Patent-Appl-SN-641832) Avail: NTIS HC $3.50 CSCL 20D

An improved accumulator particularly adapted for use in controlling the pressure of a stream of fluid in its liquid phase is disclosed; the accumulator utilizes the fluid in its gaseous phase. The accumulator is characterized by a shell defining a pressure chamber with an entry throat for a liquid and adapted to be connected in contiguous relation with a selected conduit with a stream of fluid flowing through the conduit in its liquid

phase. A pressure and volume stabilization tube, including an array of pressure relief perforations is projected into the chamber with the perforations adjacent to the entry throat for accommodating a discharge of the fluid, in either gaseous or liquid phases, while a gas inlet and liquid to gas conversion system is provided for the chamber and connected with a source of the fluid for continuously pressurizing the chamber for controlling the pressure of the stream of liquid. NASA



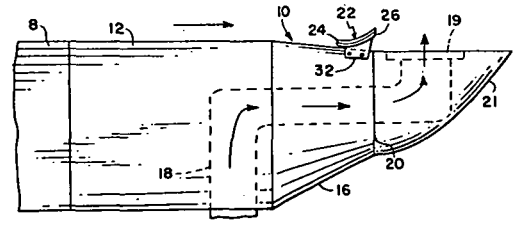


N76-18364* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
EXHAUST FLOW DEFLECTOR Patent
John C. Wilson and Craig S. Shaw, inventors (to NASA) Issued 24 Feb. 1976 5 p Filed 25 Jun. 1974 Supersedes N74-28233 (12 - 17, p 2084)
(NASA-Case-LAR-11570-1; US-Patent-3,940,097; US-Patent-Appl-SN-482967; US-Patent-Class-244-23D; US-Patent-Class-60-316) Avail: US Patent Office CSCL 20D

A deflector is reported for reducing swirling flow spillover occurring when gas flowing through curved ducting attempts to exit into a freestream flow. The deflector is arcuately shaped and positioned upstream and adjacent the exit end of the curved ducting. As the freestream flow travels over the surface of the deflector, it is turned toward the direction of the flow from the exit of the ducting and draws the exiting flow along with it. The drawn exit flow is straightened and strengthened and is able to penetrate into the freestream flow. The ends of the deflector generate vortices which draw along the swirling flow at the sides of the exit end and straighten and strengthen it also. Official Gazette of the U.S. Patent Office

N76-17317* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
HEAT EXCHANGER SYSTEM AND METHOD Patent
Alexander P. Sabol, inventor (to NASA) Issued 30 Dec. 1975 5 p Filed 27 Nov. 1973 Division of abandoned US Patent Appl. SN-301419, filed 27 Oct. 1972
(NASA-Case-LAR-10799-2; US-Patent-3,929,305; US-Patent-Appl-SN-419319; US-Patent-Class-244-117A; US-Patent-Class-165-105; US-Patent-Class-165-106; US-Patent-Class-237-60; US-Patent-Class-417-209; US-Patent-Class-244-135R; US-Patent-Appl-SN-301419) Avail: US Patent Office CSCL 20D

A heat exchange system is described which includes a reservoir for a liquid coolant, a conduit for conveying coolant from the reservoir through a heating zone, and a device, such as a check valve, for preventing reverse flow in the conduit in a direction opposite to the flow of coolant from the reservoir through the heating zone. Heat applied at the heating zone causes localized boiling of the coolant which causes the coolant to move in the conduit. The check valve prevents motion in one direction and thus the coolant flows in a desired direction in the conduit from the reservoir to and through the heating zone. The heating zone may be a surface, such as an aircraft wing leading edge, which is to be cooled. The heated liquid leaves the heating zone through a further conduit and thus removes heat from the heating zone. The heated liquid may be cooled and then returned to the reservoir for further use in the system. The heated liquid may be cooled in any convenient way. In an aircraft, the heated coolant may be passed in heat exchange with the aircraft fuel.
Official Gazette of the U.S. Patent Office

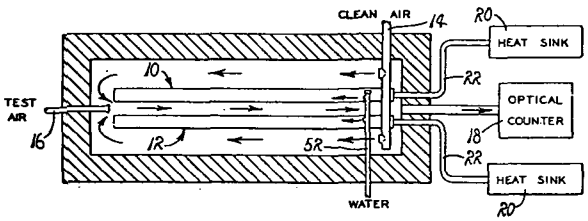


N76-18374* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
HEAT TRANSFER DEVICE Patent
Larry R. Eaton, inventor (to NASA) (McDonnell-Douglas Astronautics Co., Huntington Beach, Calif.) Issued 24 Feb. 1976

6 p Filed 21 Jan. 1975 Supersedes N75-15902 (13 - 07, p 0767) Sponsored by NASA
(NASA-Case-MFS-22938-1; US-Patent-3,940,621; US-Patent-Appl-SN-542754; US-Patent-Class-250-335) Avail: US Patent Office CSCL 20D

An improved heat transfer device particularly suited for use as an evaporator plate in a diffusion cloud chamber. The device is characterized by a pair of mutually spaced heat transfer plates, each being of a planar configuration, having a pair of opposed surfaces defining therebetween a heat pipe chamber. Within the heat pipe chamber, in contiguous relation with the pair of opposed surfaces, there is disposed a pair of heat pipe wicks supported in a mutually spaced relationship by a foraminous spacer of a planar configuration. A wick including a foraminous layer is contiguously related to the external surfaces of the heat transfer plates for uniformly wetting these surfaces.

Official Gazette for the U.S. Patent Office

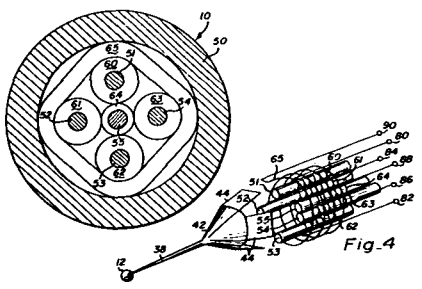


N76-19379*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SYSTEM FOR MEASURING THREE FLUCTUATING VELOCITY COMPONENTS IN A TURBULENTLY FLOWING FLUID Patent Application

Dah Yu Cheng, inventor (to NASA) (Santa Clara Univ.) Filed 15 Mar. 1976 30 p Sponsored by NASA
(NASA-Case-ARC-10974-1; US-Patent-Appl-SN-667010) Avail: NTIS HC $4.00 CSCL 20D

A system for measuring fluid velocity in a turbulently flowing fluid includes a sensing apparatus for dynamically sensing the mainstream and two orthogonal cross velocity components of the fluid, and a transducer to provide three electrical output signals representative of the velocity components in the mainstream and in the cross directions. Signal processors can be utilized to derive the Reynolds stress wave and the Reynolds stress. NASA



35 INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see *43 Earth Resources*. For related information see also *06 Aircraft Instrumentation*, and *19 Spacecraft Instrumentation*.

N76-12338*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

CAPACITIVE SHAFT ENCODER Patent Application

Ronald J. Hruby and Robert L. Wilson, inventors (to NASA) Filed 24 Oct. 1975 25 p
(NASA-Case-ARC-10897-1; US-Patent-Appl-SN-625781) Avail: NTIS HC $3.50 CSCL 14B

A precision capacitive shaft encoder for providing an analog signal corresponding to the angular position of a shaft is reported. The apparatus is comprised of a dc source voltage, first and second identical variable capacitors connected in series configuration, a discharge circuit, an oscillator for generating control signals, and switches responsive to the control signal. The oscillator also alternately connects the source and discharge circuit to the capacitors. A delay circuit for delaying the control signal and a sample-and-hold circuit responsive to the delayed control signal are also discussed. Other functions of the sample-and-hold circuit include holding the voltage appearing at a common terminal between the capacitors and providing output voltage which is proportional to the angular position of the shaft. NASA

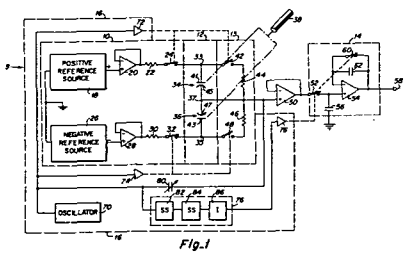


Fig. 1

N76-13454*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THERMOCOUPLES OF TANTALUM AND RHENIUM ALLOYS FOR MORE STABLE VACUUM-HIGH TEMPERATURE PERFORMANCE Patent Application

James F. Morris, inventor (to NASA) Filed 6 Nov. 1975 13 p
(NASA-Case-LEW-12050-1; US-Patent-Appl-SN-629457) Avail: NTIS HC $3.50 CSCL 14B

Thermocouples that provide stability and performance reliability in systems involving high temperatures, and vacuums through the use bimetallic sensors are examined. All metal components of the sensor are selected from a group of metals comprising tantalum and rhenium and alloys containing only those two metals. The tantalum, rhenium thermocouple sensor alloys provide bare metal thermocouple sensors with superior vapor pressure compatibilities and performance characteristics. These improved compatibility and physical characteristics sensors result in improvement emf, temperature properties and thermocouple hot junction performance. The thermocouples also exhibit reliability and performance stability in systems involving high temperatures and vacuums and are adaptable to space propulsion and power systems and nuclear environments. NASA

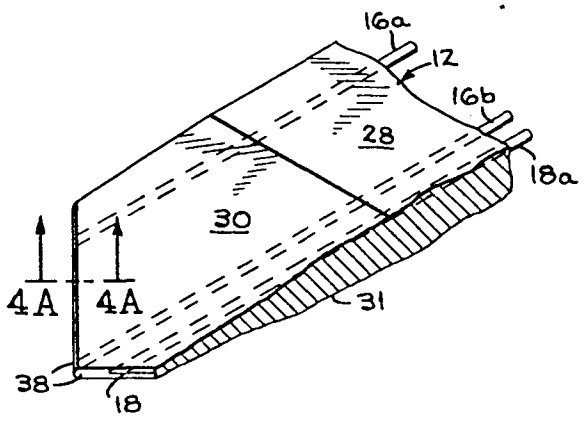
N76-13455*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

METHOD FOR MAKING A HOT WIRE ANEMOMETER AND PRODUCT THEREOF Patent Application

Volker Mikulla, inventor (to NASA) (NAS-NRC) Filed 10 Nov. 1975 14 p Sponsored by NASA

(NASA-Case-ARC-10900-1; US-Patent-Appl-SN-630579) Avail: NTIS HC $3.50 CSCL 14B

A hot wire anemometer probe is reported that includes a ceramic body supporting two conductive rods therein in parallel spaced apart relation. The body has a narrow edge surface from which the rods protrude. A probe wire is welded to the rods and extends along the edge surface; ceramic adhesive secures the probe wire to the surface. A method is described for fabricating the probe wherein the body is molded and precisely shaped by machining techniques before the probe wires are installed. NASA



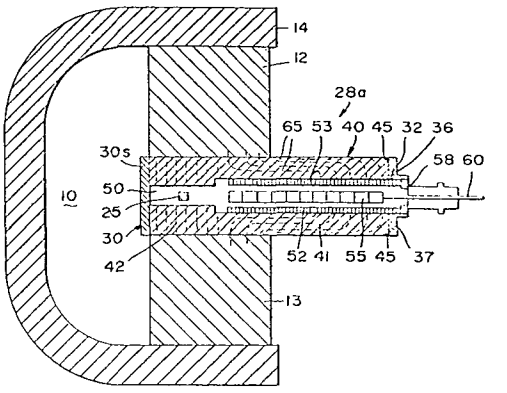
N76-13456*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MASS SPECTROMETER WITH MAGNETIC POLE PIECES PROVIDING THE MAGNETIC FIELDS FOR BOTH THE MAGNETIC SECTOR AND AN ION-TYPE VACUUM PUMP Patent Application

Charles E. Giffin (JPL), Leonard M. Sieradski (JPL), and Alfred O. Nier, inventors (to NASA) (JPL) Filed 21 Nov. 1975 18 p (Contract NAS7-100)

(NASA-Case-NPO-13663-1; US-Patent-Appl-SN-634205) Avail: NTIS HC $3.50 CSCL 14B

A mass spectrometer (MS) is reported with magnetic pole pieces which provide the magnetic fields for both the magnetic sector and an ion-type vacuum pump. NASA

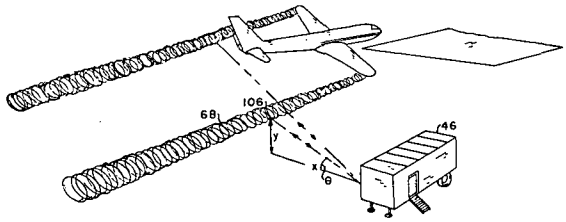


N76-13459*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

FOCUSED LASER DOPPLER VELOCIMETER Patent Application

James W. Bilbro, Ronald B. Campbell, Jr. (Raytheon Co., Lexington, Mass.), Werner K. Dahm, Robert M. Huffaker, Harold B. Jeffreys, Albert V. Jellalian, (Raytheon Co., Lexington, Mass.), Wayne H. Keene (Raytheon Co., Lexington, Mass.), Michael C. Krause (LMSC, Huntsville, Ala.), Thomas R. Lawrence (LMSC, Huntsville, Ala.), Charles M. Sonnenschein, inventors (to NASA) (Raytheon Co., Lexington, Mass.) et al Filed 3 Dec. 1975 17p (NASA-Case-MFS-23178-1; US-Patent-Appl-SN-637247) Avail: NTIS HC $3.50 CSCL 14B

A system for remotely measuring velocities present in discrete volumes of air in which a CO2 laser beam is focused by a telescope at such a volume, a focal volume, and within the focusable range, near field, of the telescope. The back scatter (or reflected light) principally from the focal volume, passes back through the telescope and is frequency compared with the original frequency of the laser; the difference frequency or frequencies represent particle velocities in that focal volume. NASA

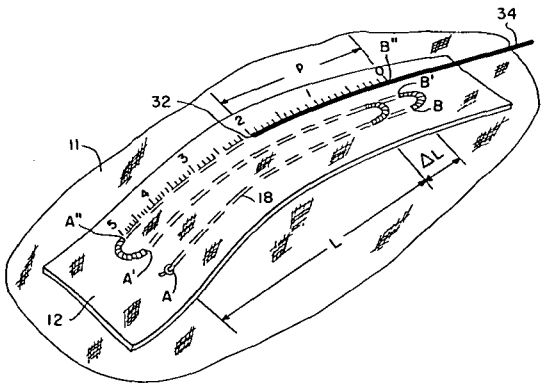


N76-13460*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

AMPLIFYING RIBBON EXTENSOMETER Patent Application

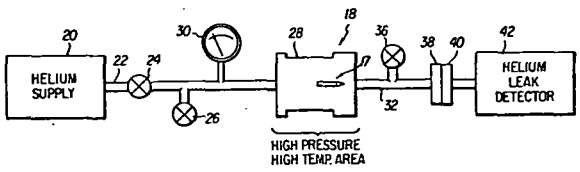
Vernon L. Alley, Jr. and Austin D. McHatton, inventors (to NASA) Filed 14 Nov. 1975 20 p
(NASA-Case-LAR-11825-1; US-Patent-Appl-SN-632112) Avail: NTIS HC $3.50 CSCL 14B

A description is given of a lightweight flexible device for measuring the maximum strain or elongation of a substance subject to loads. The device can also be used for measuring maximum relative movements between adjacent objects. In particular the device is a self-contained elastic strain gage capable of amplifying strain experienced by the relatively high elastic modulus, low strain, synthetic materials used in parachutes and other stressed fabric structures. NASA



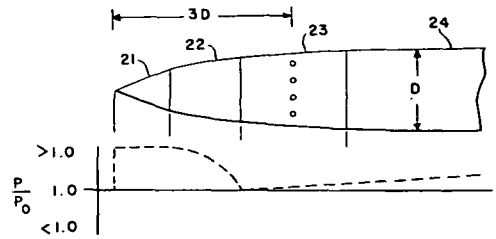
N76-13465*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
METHOD FOR FABRICATING A MASS SPECTROMETER INLET LEAK Patent Application
Robert F. Harris, inventor (to NASA) Filed 26 Nov. 1975 13 p
(NASA-Case-GSC-12077-1; US-Patent-Appl-SN-635519) Avail: NTIS HC $3.50 CSCL 14B

An inlet leak intended for use with a mass spectrometer for measuring chemically reactive species in a hostile environment is disclosed, along with a method of fabricating the leak. The leak includes a length of metal tubing formed of a high melting point material such as Kovar and a length of glass tubing, preferably formed of borosilicate glass inserted within the metal tubing and sealed to the interior surface. The glass tubing is drawn to reduce the leak aperture to a diameter slightly greater than two microns. NASA



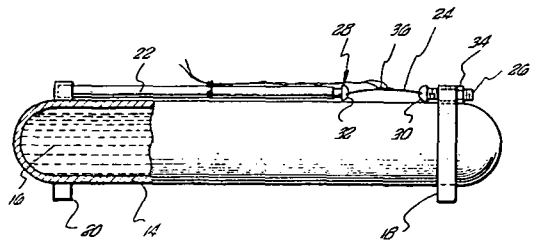
N76-14429* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
STATIC PRESSURE PROBE Patent
Shimer Z. Pinckney, inventor (to NASA) Issued 28 Oct. 1975 5 p Filed 29 Oct. 1974 Supersedes N75-10412 (12 - 01, p 0055)
(NASA-Case-LAR-11552-1; US-Patent-3,914,997; US-Patent-Appl-SN-518685; US-Patent-Class-73-182; US-Patent-Class-73-212) Avail: US Patent Office CSCL 14B

An improved static pressure probe is described which has a smaller length than conventional static probes with the same diameter, and it requires no compensation for yaw angles of up to 10. Official Gazette of the U.S. Patent Office



N76-14430* National Aeronautics and Space Administration. Pasadena Office, Calif.
STRAIN GAGE MOUNTING ASSEMBLY Patent
Robert H. Silver (JPL) and Sarkis H. Kalfayan, inventors (to NASA) (JPL) Issued 28 Oct. 1975 6 p Filed 24 Jul. 1973 Supersedes N73-28495 (11 - 19, p 2300) Sponsored by NASA
(NASA-Case-NPO-13170-1; US-Patent-3,914,991; US-Patent-Appl-SN-382261; US-Patent-Class-73-88.5R; US-Patent-Class-338-6) Avail: US Patent Office CSCL 14B

A strain gage assembly mounted on a container to monitor its internal pressure is described. A strain gage device is mounted in compression between a pair of mounting collars. The mounting arrangement translates the total strain displacement of the object or container under test between the mounting collars to apply it across the smaller gage length distance thus attaining a mechanical multiplication or amplification.
Official Gazette of the U.S. Patent Office



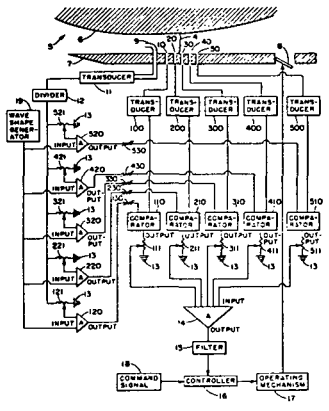
N76-14431* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

SHOCK POSITION SENSOR FOR SUPERSONIC INLETS Patent

Miles O. Dustin inventor (to NASA) 7 Oct. 1975 7 p Filed 30 May 1974 Supersedes N74-25805 (12-15, p 1774)
(NASA-Case-LEW-11915-1; US-Patent-3,911,260; US-Patent-Appl-SN-474744; US-Patent-Class-235-151.34; US-Patent-Class-60-39.29; US-Patent-Class-137-15.2) CSCL 14B

Static pressure taps or ports are provided in the throat of a supersonic inlet, and signals indicative of the pressure at each of the ports is fed to respective comparators. Means are also provided for directing a signal indicative of the total throat pressure to the comparators. A periodic signal is superimposed on the total throat pressure so that the signal from the static pressure tabs is compared to a varying scan signal rather than to total throat pressure only. This type of comparison causes each comparator to provide a pulse width modulated output which may vary from 0% 'time on' to 100% 'time on'. The pulse width modulated outputs of the comparators are summed, filtered, and directed to a controller which operates a bypass valve such as a door whereby air is dumped from the inlet to prevent the shock wave from being expelled out the front.

Official Gazette of the U.S. Patent Office



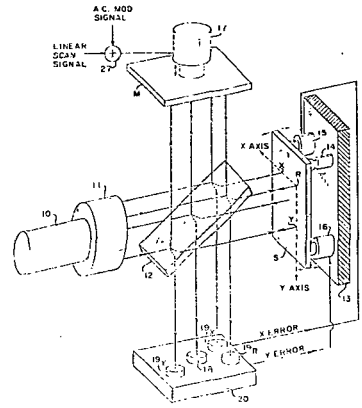
N76-14433*# National Aeronautics and Space Administration. Pasadena Office, Calif.

INTERFEROMETER MIRROR TILT CORRECTING SYSTEM Patent Application

Rudolf A. Schindler, inventor (to NASA) (JPL) Filed 18 Dec. 1975 16 p
(Contract NAS7-100)
(NASA-Case-NPO-13687-1; JPL-Case-13687; US-Patent-Appl-SN-641803) Avail: NTIS HC $3.50 CSCL 14B

An interferometer is described which has servo means for automatically adjusting the angular tilt of a reflecting surface in one of two paths to maintain the exit beams from the two paths parallel to each other. Three detectors at the output of the interferometer are disposed on mutually perpendicular axes which define a plane normal to the nominal exit beam axis. One detector at the origin of the axes is used as a reference for separate phase-difference comparison with the outputs of the other two detectors on the X and Y axes to develop servo error signals.

NASA



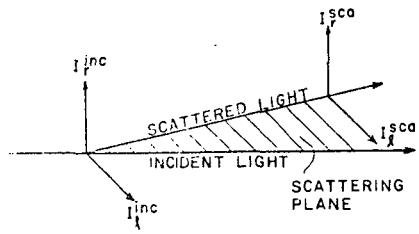
N76-14434*# National Aeronautics and Space Administration. Pasadena Office, Calif.

FORWARD-SCATTER POLARIMETER FOR DETERMINING THE GASEOUS DEPOLARIZATION FACTOR IN THE PRESENCE OF POLLUTING POLYDISPERSED PARTICLES Patent Application

Alain L. Fymat, inventor (to NASA) (JPL) Filed 18 Dec. 1975 18 p
(Contract NAS7-100)
(NASA-Case-NPO-13756-1; JPL-Case-13756; US-Patent-Appl-SN-641801) Avail: NTIS HC $3.50 CSCL 14B

A method and an apparatus are described for determining, under conditions of near-forward scattering, the depolarization factor of gases in an arbitrary mixture with polydispersions of unknown polluting particles of any size distribution and concentration.

NASA



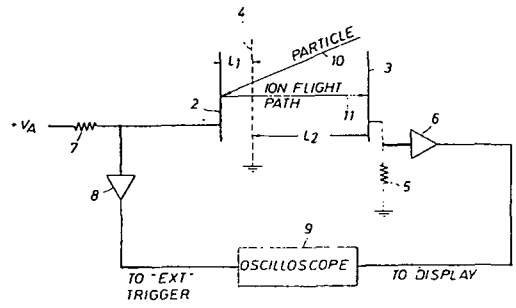
N76-15431* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

COSMIC DUST ANALYZER Patent

Neal L. Roy, inventor (to NASA) (TRW Systems Group, Redondo Beach, Calif.) Issued 28 Oct. 1975 18 p Filed 31 May 1974 Supersedes N74-32883 (12 - 22, p 2694) Continuation-in-part of abandoned US Patent Appl. SN-189438, filed 14 Oct. 1971 Sponsored by NASA
(NASA-Case-MSC-13802-2; US-Patent-3,916,187; US-Patent-Appl-SN-475338; US-Patent-Class-250-251; US-Patent-Class-250-287; US-Patent-Class-250-423; US-Patent-Appl-SN-189438) Avail: US Patent Office CSCL 14B

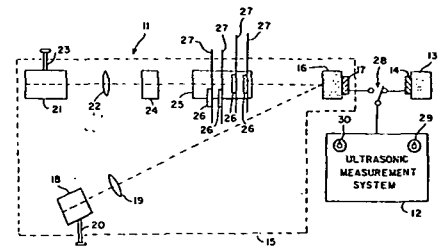
The patent of an invention dealing with a cosmic dust analyzer was presented. Methods and apparatus are provided which employ ion time-of-flight techniques to determine the composition of a high velocity particle such as a micrometeorite. A charged target electrode formed of two known materials is arranged to intercept the particle, the impact of which creates a discrete plasma of ions of both the known target material as well as the particle matter. A charged collector electrode receives the ions from the target, which tend to travel at a velocity which is approximately a function of their mass only. The fractional ionization for an arbitrary atomic species can be specified by the Saha equation. Given the temperature, the procedure can be reversed to yield the relative abundance of elements in the impacting particle.

Y.J.A.



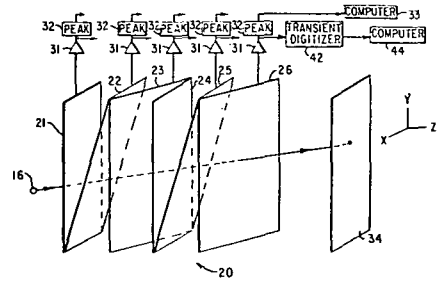
N76-15432* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
ULTRASONIC CALIBRATION DEVICE Patent
Joseph S. Heyman and James G. Miller, inventors (to NASA) Issued 9 Dec. 1975 4 p Filed 11 Nov. 1974 Supersedes N75-11248 (13 - 02, p 0162)
(NASA-Case-LAR-11435-1; US-Patent-3,924,444; US-Patent-Appl-SN-522556; US-Patent-Class-73-1R; US-Patent-Class-310-8.2) Avail: US Patent Office CSCL 14B

An ultrasonic calibration device for producing known changes in both acoustic absorption and phase velocity is described. The calibration signal arises from an actual change of acoustic parameters, not from an electrical simulation. Thus, changes in ultrasonic time-domain decay rates and frequency-domain line widths are produced. The device is able to simulate not only changes in ultrasonic absorption and phase velocity but also the sensitivity enhancement achieved by the use of ultrasonic resonators. Official Gazette of the U.S. Patent Office



N76-15433* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MICROMETEOROID VELOCITY AND TRAJECTORY ANALYZER Patent
Siegfried O. Auer, inventor (to NASA) (NAS-NRC) Issued 16 Dec. 1975 9 p Filed 30 Aug. 1974 Supersedes N74-32888 (12 - 22, p 2694) Sponsored by NASA
(NASA-Case-GSC-11892-1; US-Patent-3,927,324; US-Patent-Appl-SN-502135; US-Patent-Class-250-336; US-Patent-Class-250-385; US-Patent-Class-250-489) Avail: US Patent Office CSCL 14B

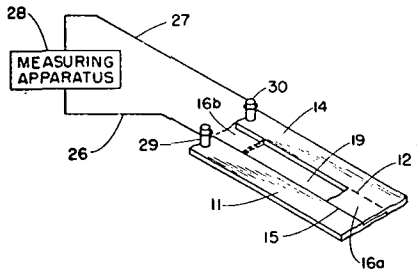
Movement of a charged particle through a region is detected by providing a detector including first, second and third spaced metal grids previous to the particle and positioned so that the particle passes through them in sequence. The first and third grids are short-circuited to each other and to ground. A signal input terminal of a d.c. amplifier is connected in d.c. circuit with the second grid so that a voltage pulse induced in the second grid by the particle passing through the three grids results in an output pulse of the amplifier. A plurality of such detectors are arranged for enabling the position and velocity vectors of the charged particle to be detected in three mutually orthogonal axes, X, Y and Z. Official Gazette of the U.S. Patent Office



N76-15434* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
THERMOCOUPLE TAPE Patent

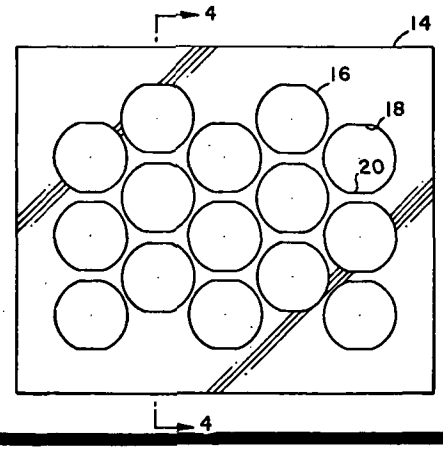
Ralph D. Thomas, inventor (to NASA) Issued 9 Dec. 1975 5 p Filed 17 May 1972 Supersedes N72-28443 (10 - 19, p 2562) Division of US Patent Appl. SN-104885, filed 8 Jan. 1971, US-Patent-3,729,343
(NASA-Case-LEW-11072-2; US-Patent-3,925,104; US-Patent-Appl-SN-254323; US-Patent-Class-136-225; US-Patent-Class-136.211; US-Patent-Class-136-212; US-Patent-Appl-SN-104885; US-Patent-3,729,343) Avail: US Patent Office CSCL 14B

A thermocouple which may be rolled as a tape until needed and a method of making same are described. Thermoelectrically different metals are applied to a strip of electrically nonconductive material in longitudinally overlapping relationship. Apertures may be provided along the tape in the overlapping region at predetermined intervals. An adhesive material is applied to the side of the tape opposite the thermoelectric metals either before or after the thermoelectric metals are deposited. The tapes may be cut or torn to form a thermocouple device which is ready for application to a body whose temperature is to be monitored or measured. Official Gazette of the U.S. Patent Office



N76-15435* National Aeronautics and Space Administration. Pasadena Office, Calif.
DICHROIC PLATE Patent
Philip D. Potter, inventor (to NASA) (JPL) Issued 2 Dec. 1975 5 p Filed 27 Jun. 1974 Supersedes N74-27690 (12 - 17, p 2014) Sponsored by NASA
(NASA-Case-NPO-13506-1; US-Patent-3,924,239; US-Patent-Appl-SN-483851; US-Patent-Class-343-909) Avail: US Patent Office CSCL 14B

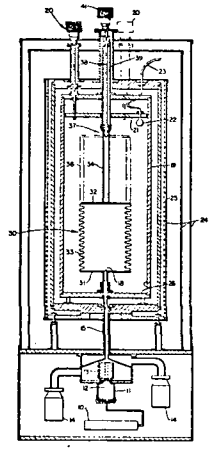
A dichroic plate is disclosed for passing radiation within a particular frequency band and reflecting radiation outside of that frequency band. The value of the thickness of the plate is selected so that the plate acts as a resonant narrow band pass filter for the desired pass frequency, and the shapes of the apertures in the dichroic plate are selected to compensate for the phase shift caused by the air-plate interface presented to the signals passing therethrough. Official Gazette of the U.S. Patent Office



N76-15436* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
ATOMIC STANDARD WITH VARIABLE STORAGE VOLUME Patent
Harry E. Peters, inventor (to NASA) Issued 2 Dec. 1975 5 p Filed 3 Oct. 1974 Supersedes N74-33997 (12 - 23, p 2838)
(NASA-Case-GSC-11895-1; US-Patent-3,924,200; US-Patent-Appl-SN-511887; US-Patent-Class-331-94; US-Patent-Class-331-3) Avail: US Patent Office CSCL 14B

A cylindrical, convoluted, flexible bellows is used to form an atomic or molecular storage vessel with constant surface area and surface properties but adjustable volume. When utilized as a storage bulb inside an atomic or molecular frequency standard such as a hydrogen maser, it provides an apparatus for obtaining an extremely accurate measurement of the frequency deviation caused by the interaction of gas atoms (or molecules) with the vessel wall surface.

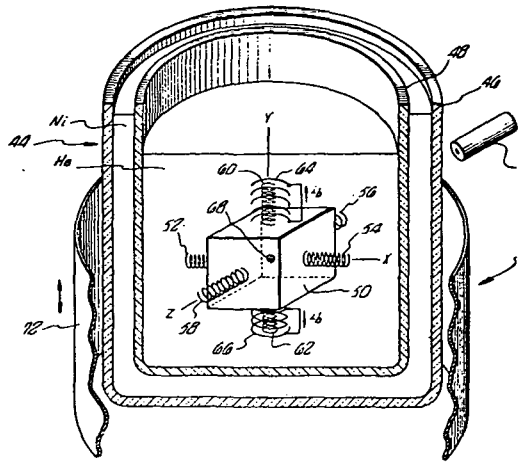
Official Gazette of the U.S. Patent Office



N76-16390* National Aeronautics and Space Administration. Pasadena Office, Calif.
MAGNETOMETER USING SUPERCONDUCTING ROTATING BODY Patent
Melvin M. Saffren (JPL) and Daniel D. Elleman, inventors (to NASA) (JPL) Issued 2 Dec. 1975 8 p Filed 11 Nov. 1974 Supersedes N75-11309 (13 - 02, p 0171) Sponsored by NASA
(NASA-Case-NPO-13388-1; US-Patent-3,924,176; US-Patent-Appl-SN-522552; US-Patent-Class-324-43R) Avail: US Patent Office CSCL 14B

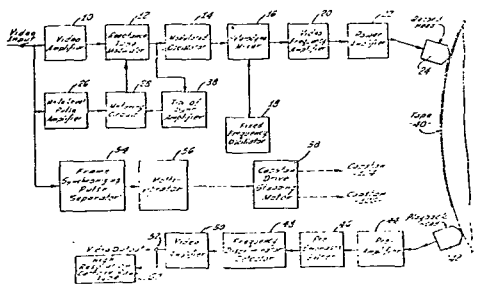
A method and apparatus for measuring the strength and direction of an unknown magnetic field are disclosed. A freely rotatable suspended superconducting body, such as a sphere, is maintained at a superconducting temperature. A magnetic field to be measured induces super current flow on the sphere's surface. The induced current causes the sphere to rotate at a rate that is proportional to the strength of the field, and the axis of rotation of the sphere aligns with the direction of the magnetic field to be measured. An operator applies current to orthogonal electromagnetic coils arranged relative to the sphere so as to apply variable magnetic fields to the sphere. Varying the current and the resulting fields nulls out the effect of the magnetic field

to be measured; measurement of the nulling currents indicate the direction and strength of the unknown magnetic field.
Official Gazette of the U.S. Patent Office



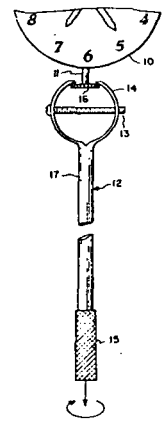
N76-16391* National Aeronautics and Space Administration. Pasadena Office, Calif.
SCAN CONVERTING VIDEO TAPE RECORDER *Patent*
Norman I. Holt, inventor (to NASA) (JPL) Issued 2 Dec. 1975 9 p Filed 27 Oct. 1971 Continuation-in-part of abandoned US Patent Appl. SN-668116, filed 15 Sep. 1967 Sponsored by NASA
(NASA-Case-NPO-10166-2; US-Patent-3,924,267; US-Patent-Appl-SN-192803; US-Patent-Class-360-9; US-Patent-Class-360-10; US-Patent-Class-360-35; US-Patent-Class-360-101; US-Patent-Appl-SN-668116) Avail: US Patent Office CSCL 14B

A video tape recorder with broad bandwidth capabilities for recording color television signals, and which has the capability of playing back the recorded television signals at a scan rate different from that at which the signals were recorded is introduced. The recorder also allows television signals of one scanning standard to be converted to television signals of a second scanning standard.
Official Gazette of the U.S. Patent Office



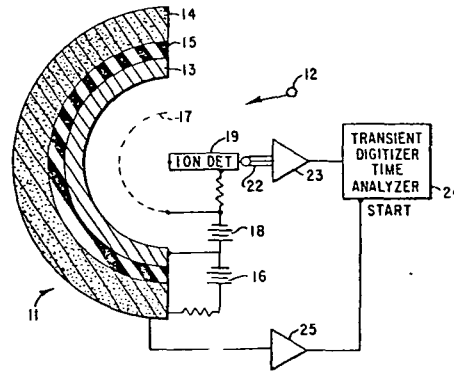
N76-16392* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
CLOCK SETTER *Patent*
Claude T. Haley, inventor (to NASA) Issued 30 Dec. 1975 4 p Filed 9 Sep. 1974 Supersedes N74-32882 (12 - 22, p 2694)
(NASA-Case-LAR-11458-1; US-Patent-3,929,364; US-Patent-Appl-SN-504225; US-Patent-Class-294-19R; US-Patent-Class-294-1R) Avail: US Patent Office CSCL 14B

An apparatus is described for manually adjusting large wall-mounted clocks while the operator remains safely on the floor, comprising a long handled tool which slips over the reset knob of such clocks allowing a downward and twisting motion to adjust the indicated time.
The Official Gazette of the U.S. Patent Office



N76-16393* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MOVING PARTICLE COMPOSITION ANALYZER *Patent*
Siegfried O. Auer, inventor (to NASA) (NAS-NRC) Issued 6 Jan. 1976 6 p Filed 30 Aug. 1974 Supersedes N74-32887 (12 22, p 2694) Sponsored by NASA
(NASA-Case-GSC-11889-1; US-Patent-3,931,516; US-Patent-Appl-SN-502124; US-Patent-Class-250-281; US-Patent-Class-250-287; US-Patent-Class-250-288; US-Patent-Class-250-385; US-Patent-Class-250-423) Avail: US Patent Office CSCL 14B

A mass spectrometry apparatus for analyzing the composition of moving microscopic particles is introduced. The apparatus includes a capacitor with a front electrode upon which the particles impinge, a back electrode, and a solid dielectric sandwiched between the front and back electrodes. In one embodiment, the



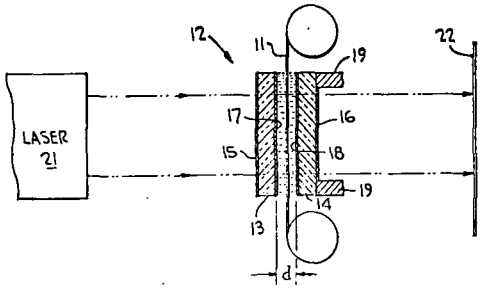
N76-16395*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

METHOD AND APPARATUS FOR CONTROLLING THE CONTRAST OF A PHOTOGRAPHIC TRANSPARENCY Patent Application

Sing H. Lee and Arnold R. Shulman, inventors (to NASA) Filed 30 Dec. 1975 19 p

(NASA-Case-GSC-11989-1; US-Patent-Appl-SN-645500) Avail: NTIS HC $3.50 CSCL 14E

An apparatus and method for controlling the contrast of a photographic transparent image by projecting a coherent beam of optical energy onto the image via an optical cavity are reported. Mirrors are used to trap a collimated laser beam illuminating the transparency so that at least a portion of the beam energy is passed through the transparency plural times. The distance that the light beam travels between the mirrors is controlled as a function of the wavelength of the beam energy to control the phase of light interference in the beam passing through the transparency, thereby controlling the intensity of the beam derived from the mirror downstream of the transparency. The contrast of the transparency is increased or decreased, depending upon whether constructive or destructive interference for the beam energy is provided by the mirror spacing. For a negative input transparency a low to high contrast projected negative or positive image can be obtained. NASA



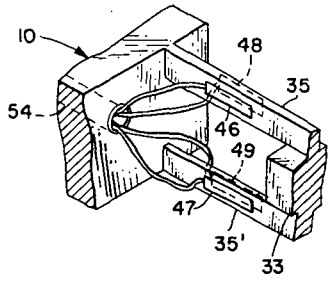
N76-16396*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

MINIATURE BIAXIAL STRAIN TRANSDUCER Patent Application

Ira S. Hoffman, inventor (to NASA) Filed 30 Dec. 1975 13 p

(NASA-Case-LAR-11648; US-Patent-Appl-SN-645571) Avail: NTIS HC $3.50 CSCL 14B

A reusable miniature strain transducer is described for use in the measurement of static or quasi-static, high level, biaxial strain on the surface of test specimens or structures. Two cantilever arms, constructed by machining the material to appropriate flexibility, are self-aligning and constitute the transducing elements of the device. Used in conjunction with strain gages, the device enables testing beyond normal gage limits for high strains and number of load cycles. The device does not require conversion computations since the electrical output of the strain gages is directly proportional to the strain measured. NASA



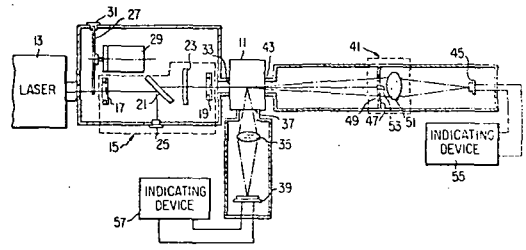
N76-17369*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

A 2 DEGREE/90 DEGREE LABORATORY SCATTERING PHOTOMETER Patent Application

W. R. McCluney, inventor (to NASA) Filed 13 Jan. 1976 16 p

(NASA-Case-GSC-12088-1; US-Patent-Appl-SN-648700) Avail: NTIS HC $3.50 CSCL 14B

A scattering photometer was developed for measuring the light scattered by particles in a hydrosol at substantially 2 deg and 90 deg simultaneously. Light from a source is directed by a first optical system into a scattering cell containing the hydrosol under study. Light scattered at substantially 90 deg to the incident beam is focused onto a first photoelectric detector to generate an electrical signal indicative of the amount of scattered light at substantially 90 deg. Light scattered at substantially 2 deg to the incident beam is directed through an annular aperture symmetrically located about the axis of the illuminating beam which is linearly transmitted undeviated through the hydrosol and focused onto a second photoelectric detector to generate an electrical signal indicative of the amount of light scattered at substantially 2 deg. NASA



N76-18400* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

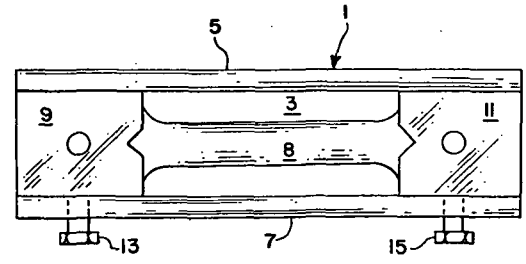
METHOD AND APPARATUS FOR TENSILE TESTING OF METAL FOIL Patent

Orval W. Wade, inventor (to NASA) (Martin Marietta Aerospace, Denver) Issued 17 Feb. 1976 6 p Filed 27 Jun. 1974 Supersedes N74-30894 (12 - 20, p 2436) Sponsored by NASA

(NASA-Case-LAR-10208-1; US-Patent-3,938,373; US-Patent-Appl-SN-483858; US-Patent-Class-73-95; US-Patent-Class-73-103) Avail: US Patent Office CSCL 14B

A method for obtaining accurate and reproducible results in the tensile testing of metal foils in tensile testing machines is described. Before the test specimen are placed in the machine, foil side edges are worked until they are parallel and flaw free. The specimen are also aligned between and secured to grip end members. An aligning apparatus employed in the method is comprised of an alignment box with a longitudinal bottom wall and two upright side walls, first and second removable grip end members at each end of the box, and a means for securing the grip end members within the box.

Official Gazette of the U.S. Patent Office



N76-18401* National Aeronautics and Space Administration. Pasadena Office, Calif.

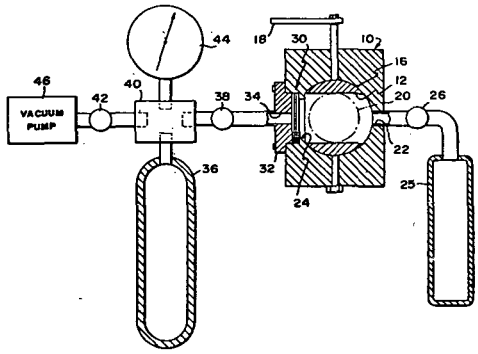
SAMPLER OF GAS BORNE PARTICLES Patent

Charles G. Miller (JPL) and James B. Stephens, inventors (to NASA) (JPL) Issued 17 Feb. 1976 7 p Filed 28 Mar. 1975 Supersedes N75-21601 (13 - 35, p 1510) Sponsored by NASA

(NASA-Case-NPO-13396-1; US-Patent-3,938,367; US-Patent-Appl-SN-563283; US-Patent-Class-73-28; US-Patent-Class-55-261; US-Patent-Class-73-421.5R) Avail: US Patent Office CSCL 14B

An atmosphere sample is described which includes a very thin filter element with straight-through holes on the order of 1 micron. A sample of air with particles to be examined is driven by means of a pressurized low molecular weight gas, e.g. He, to the filter element front side. A partial vacuum may be present at the back side of the filter element. The pressure differential across the filter element is just below the rupture point of the filter element. Particles smaller than filter holes are deposited on the filter element. When using a filter element of plastic material of a thickness on the order of 10 microns, a stainless steel back-up plate and a diffusion member are used to support the filter element when subjected to a pressure differential on the order of a few hundred atmospheres.

Official Gazette of the U.S. Patent Office



N76-18402* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

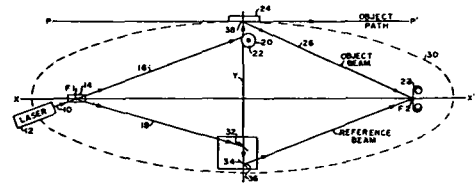
HOLOGRAPHIC MOTION PICTURE CAMERA WITH DOPPLER SHIFT COMPENSATION Patent

Robert L. Kurtz, inventor (to NASA) Issued 10 Feb. 1976 6 p Filed 17 Sep. 1974 Supersedes N74-33943 (12 - 23, p 2831)

(NASA-Case-MFS-22517-1; US-Patent-3,937,555; US-Patent-Appl-SN-506804; US-Patent-Class-350-3.5) Avail: US Patent Office CSCL 14E

A holographic motion picture camera is reported for producing three dimensional images by employing an elliptical optical system. There is provided in one of the beam paths (the object or reference beam path) a motion compensator which enables the camera to photograph faster moving objects.

Official Gazette of the U.S. Patent Office



N76-18403* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

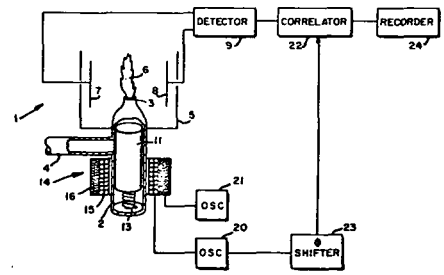
MODULATED HYDROGEN ION FLAME DETECTOR Patent

John Dimeff, inventor (to NASA) 17 Feb. 1976 4 p Filed 28 Jun. 1974 Supersedes N74-27875 (12 - 17, p 2037)

(NASA-Case-ARC-10322-1; US-Patent-3,938,956; US-Patent-Appl-SN-484209; US-Patent-Class-23-254EF) Avail: US Patent Office CSCL 14B

In a hydrogen flame detector there is provided a means for modulating the density of a gas stream prior to its introduction into the detector flame. A detector, responsive to the resulting modulation of the flame, is provided for producing an output signal having a component fluctuating at the frequency of modulation. A cross-correlator, responsive to the output signal and a signal at the frequency of modulation, is provided for producing a resultant signal proportional to the cross correlation between its two input signals. A means is further provided for recording or otherwise utilizing the resultant signal thus produced.

Office Gazette of the U.S. Patent Office



N76-18413*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

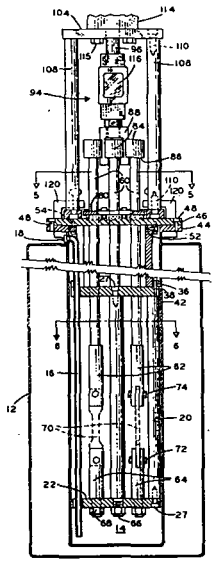
A DEVICE FOR TENSIONING TEST SPECIMENS WITHIN AN HERMETICALLY SEALED CHAMBER Patent Application

Page K. Evans and Dan L. Shady, inventors (to NASA) (Sperry Rand Corp.) Filed 13 Feb. 1976 17 p

(NASA-Case-MFS-23281-1; US-Patent-Appl-SN-657995) Avail: NTIS HC $3.50 CSCL 14B

A device for tensioning test specimens within an hermetically sealed chamber is reported. The device is characterized by a support column adapted to be received within an insulated, hermetically sealable chamber, a plurality of anchor pins mounted on the column for releasibly connecting thereto a plurality of test specimens, a plurality of axially displaceable pull rods received by the column in coaxial alignment with the anchor pins. One end of each pull rod is being provided with a coupling for connecting the pull rod to a test specimen, while the opposite end of the pull rod is extended through a cover plate and adapted to be connected with a remotely related linear actuator through

a connecting link including a load cell for measuring stresses as the pull rod is placed in tension by the actuator. NASA



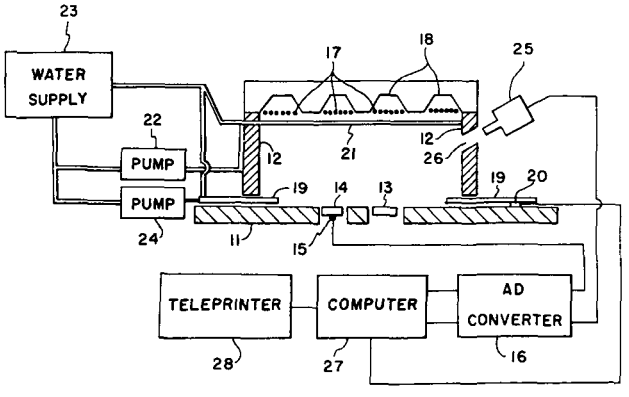
N76-18415*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

APPARATUS FOR DETERMINING THERMOPHYSICAL PROPERTIES OF TEST SPECIMENS Patent Application

Richard R. Corwin (Beta Industries, Inc.), Joseph S. Kramer (Beta Industries, Inc.), Theodore R. Creel, Jr., and Robert A. Jones, inventors (to NASA) Filed 27 Feb. 1976 9 p

(NASA-Case-LAR-11883-1; US-Patent-Appl-SN-662175) Avail: NTIS HC $3.50 CSCL 14B

Apparatus for directly measuring thermophysical properties of a test specimen such as a wind tunnel model is described. The test specimen and a reference specimen are simultaneously subjected to the heat from a heat source. A thermocouple is attached to the reference specimen for producing a first electrical analog signal proportional to the heat rate that the test specimen is subjected to, and an infrared radiometer that is aimed at the test specimen produces a second electrical analog signal proportional to the surface temperature of the test specimen. An analog-to-digital converter converts the first and second electrical analog signals to digital signals. These digital signals are applied to a computer for calculating the thermophysical properties. NASA



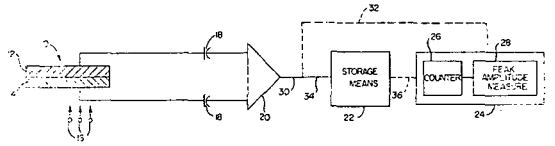
N76-19405*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SEMICONDUCTOR PROJECTILE IMPACT DETECTOR Patent Application

Edward L. Shriver, inventor (to NASA) Filed 11 Mar. 1976 11 p

(NASA-Case-MFS-23008-1; US-Patent-Appl-SN-665734) Avail: NTIS HC $3.50 CSCL 14B

A semiconductor projectile impact detector is reported for use in determining micrometeorite presence as well as its flux and energy. The device comprises a photovoltaic cell which generates a voltage according to the light and heat emitted by the micrometeorites upon impact with the cell. A counter and a peak amplitude measuring device are used to indicate the number of particles which strike the surface of the cell as well as the kinetic energy of each of the particles. NASA



N76-19407*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

THERMOCOUPLES OF MOLYBDENUM AND IRIDIUM ALLOYS FOR MORE STABLE VACUUM-HIGH TEMPERATURE PERFORMANCE Patent Application

James F. Morris, inventor (to NASA) Filed 18 Mar. 1976 14 p

(NASA-Case-LEW-12174-1; US-Patent-Appl-SN-667929) Avail: NTIS HC $3.50 CSCL 14B

Thermocouples that provide stability and performance reliability in systems involving high temperatures and vacuums are presented: the device employs a bimetallic thermocouple sensor where each metal of the sensor is selected from a group of metals comprising molybdenum and iridium and alloys containing only those two metals. The molybdenum, iridium thermocouple sensor alloys provide bare metal thermocouple sensors with advantageous vapor pressure compatibilities and performance characteristics. The compatibility and physical characteristics of the thermocouple sensor alloys result in improved emf, temperature properties and thermocouple hot junction performance. Thermocouples formed of the molybdenum, iridium alloys are adaptable to space propulsion and power systems and nuclear environments. NASA

N76-19408*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

CAMERA ARRANGEMENT Patent Application

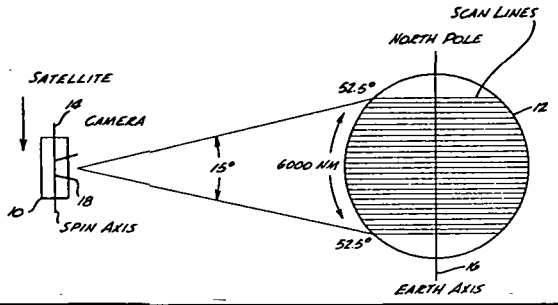
Robert F. Hummer (Santa Barbara Res. Center) and Deane T. Upton, inventors (to NASA) (Santa Barbara Res. Center) Filed 19 May 1975 21 p

(Contract NAS5-9677)

(NASA-Case-GSC-12032-2; US-Patent-Appl-SN-578700) Avail: NTIS HC $3.50 CSCL 14E

An aerial vehicle rotating in gyroscopic fashion about one of its axes is described. An optical system is present at the rotation site and operates to scan an area below the vehicle in determined relation to vehicle rotation. A sensing device is provided to sense the physical condition of the area of scan and optical means are present to direct the physical intelligence received from the scan area to the sensing means. Methods are

provided to incrementally move the optical system through a series of steps to effect sequential line scan of the area being viewed and keyed to the rotational rate of the vehicle. NASA

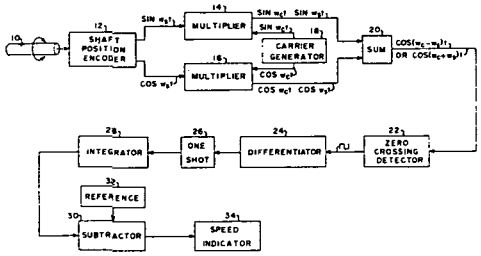


N76-19409*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

TACHOMETER Patent Application

Frank J. Nola, inventor (to NASA) Filed 18 Mar. 1976 11 p (NASA-Case-MFS-23175-1; US-Patent-Appl-SN-667928) Avail: NTIS HC $3.50 CSCL 14B

A description is given of a tachometer in which sine and cosine signals responsive to the angular position of a shaft as it rotates are each multiplied by like, sine or cosine, functions of a carrier signal, and the products summed: the resulting frequency signal is converted to fixed height and fixed width pulses of a like frequency. These pulses are the integrated, and the resulting dc output is an indication of shaft speed. NASA



36 LASERS AND MASERS

Includes parametric amplifiers.

N76-14447* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

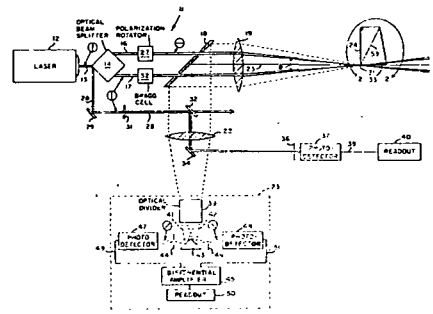
COMBINED DUAL SCATTER, LOCAL OSCILLATOR LASER DOPPLER VELOCIMETER Patent

Kenneth L. Orloff, inventor (to NASA) Issued 28 Oct. 1975 7 p Filed 27 Feb. 1974 Supersedes N74-18099 (12 - 09, p 1050)

(NASA-Case-ARC-10642-1; US-Patent-3,915,572; US-Patent-Appl-SN-446562; US-Patent-Class-356-106R; US-Patent-Class-356-28) Avail: US Patent Office CSCL 20E

A laser Doppler velocimeter is described which is capable of effectively measuring two different velocity components of a fluid simultaneously. Such a velocimeter includes a pair of coherent beams of laser light which are focused to an intersection point through which flow particles within the fluid whose velocity is to be measured. Both beams are plane polarized with the plane of polarization of one being rotated normally with respect to the other, which the result that the scattered radiation is separable into two different beams respectively corresponding to the two incident beams. Such scattered radiation is Doppler shifted by the moving particles and is collected for conventionally providing a measurement of the velocity of any particle flowing through the intersection point on a path which is generally transverse. The wavelength of the light scattered by the particles from one of the beams is compared to the wavelength of such beam prior to it being Doppler shifted by the moving particles.

Official Gazette of the U.S. Patent Office



N76-15451*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

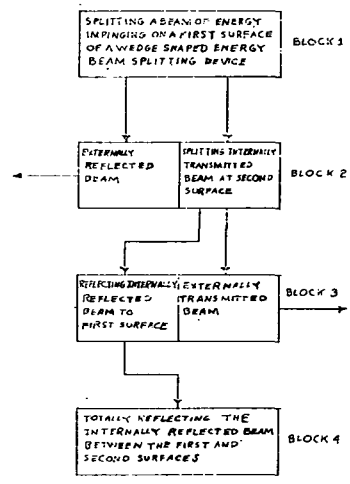
METHOD AND APPARATUS FOR SPLITTING A BEAM OF ENERGY Patent Application

Walter Robert Leeb, inventor (to NASA) (NAS-NRC) Filed 23 Dec. 1975 35 p

(Contract NASw-2567)

(NASA-Case-GSC-12083-1; US-Patent-Appl-SN-643897) Avail: NTIS HC $4.00 CSCL 20E

An energy beam splitting is described that has a first surface for splitting an incident beam energy into an externally reflected beam and an internally transmitted beam, and a second surface spaced from the first surface for splitting the internally transmitted beam into an externally transmitted beam and into an internally reflected beam. The second surface intersects the first surface so that it impinges the internally transmitted beam on the second surface at an angle of incidence that is less than the minimum angle necessary for substantially total internal reflection. NASA



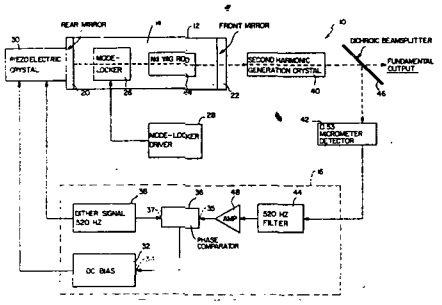
N76-17384*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

A LENGTH CONTROLLED STABILIZED MODE-LOCK Nd:YAG LASER Patent Application

John Osmundson, inventor (to NASA) (NAS-NRC) Filed 5 Jan. 1976 19 p Sponsored by NASA

(NASA-Case-GSC-11571-1; US-Patent-Appl-SN-646704) Avail: NTIS HC $3.50 CSCL 20E

A method and apparatus are described for stabilizing the amplitude and repetition rate of mode-locked Nd:YAG laser pulses by controlling the laser length through a feedback loop. The end mirror of the laser is mounted on a piezoelectric crystal which is dithered at a low frequency. A portion of fundamental 1.06 micrometer laser radiation is converted into its second harmonic frequency, and the average power of the second harmonic frequency is detected by an integrating detector. The amount of the power of the second harmonic frequency depends on the match between the optical length of the laser cavity and the mode-lock frequency. The length is controlled by a feedback loop which compared the output of the second harmonic detector to the piezoelectric crystal dither signal. NASA



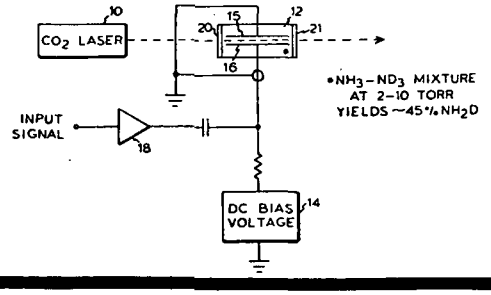
N76-18427* National Aeronautics and Space Administration. Pasadena Office, Calif.

STARK-EFFECT MODULATION OF CO2 LASER WITH NH2D Patent

Alan R. Johnston (JPL) and Richard D. S. Melville, inventors (to NASA) (JPL) Issued 23 Apr. 1974 8 p Filed 6 Jul. 1972 Sponsored by NASA

(NASA-Case-NPO-11945-1; US-Patent-3,806,834; US-Patent-Appl-SN-269450; US-Patent-Class-332-7.51; US-Patent-Class-331-94.5; US-Patent-Class-350-150; US-Patent-Class-350-160; US-Patent-Class-423-352; US-Patent-Class-423-644) Avail: US Patent Office CSCL 20E

The molecular stark-effect in NH2D is used to modulate the 10.6 microns, P(20) line of a CO2 laser. A 25 cm cell external to the laser is filled with about equal parts of NH2 and ND3 to a total pressure between 2 and 10 torr. An equilibrium concentration of NH2D as high as 45 percent is rapidly achieved. The cell is biased with a dc field (3.8 + or - 0.1 KV/cm) and modulated with an ac signal of (about 20 V RMS). At a cell pressure of a 4 torr, a modulation depth of 40 percent is achieved. Official Gazette of the U.S. Patent Office



N76-18428* National Aeronautics and Space Administration. Pasadena Office, Calif.

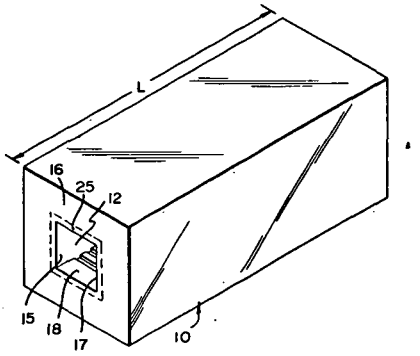
DIFFUSED WAVEGUIDING CAPILLARY TUBE WITH DISTRIBUTED FEEDBACK FOR A GAS LASER Patent

Charles Elachi, inventor (to NASA) Issued 17 Feb. 1976 8 p Filed 17 Dec. 1974 Supersedes N75-15974 (13 - 07, p 0776) Sponsored by NASA

(NASA-Case-NPO-13544-1; US-Patent-3,939,439; US-Patent-Appl-SN-533555; US-Patent-Class-331-94.5C; US-Patent-Class-350-96WG) Avail: US Patent Office CSCL 20E

For use in a waveguide gas laser, a capillary tube of glass or ceramic has an inner surface defining a longitundinal capillary opening through which the laser gas flows. At least a portion of the inner surface is corrugated with corrugations or channels with a periodicity Lambda where Lambda = 1/2 Lambda, Lambda being the laser gas wavelength. The tube includes a diffused region extending outwardly from the opening. The diffused region of a depth d on the order of 1 Lambda to 3 Lambda acts as a waveguide for the waves, with the corrugations producing distributed feedback. The evanescent component of the waves traveling in the diffused region interact with the laser gas in the opening, gaining energy, and thereby amplifying the waves travelling in the diffused region, which exit the diffused region, surrounding the opening, as a beam of wavelength Lambda.

Official Gazette of the U.S. Patent Office



N76-20466*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

WIDEBAND HETERODYNE RECEIVER FOR A LASER COMMUNICATION SYSTEM Patent Application

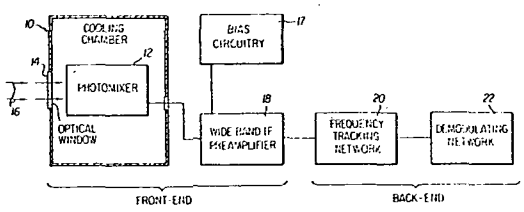
Bernard J. Peyton (Airborne Instr. Lab., Long Island N. Y.), Theodore Flattau (Airborne Instr. Lab., Long Island, N. Y.), John M. Wolczok (Airborne Instr. Lab., Long Island, N. Y.), John W. Mellars (Airborne Instr. Lab., Long Island, N. Y.), and Ronald A. Lange, inventors (to NASA) (Airborne Instr. Lab., Long Island, N. Y.) Filed 18 Mar. 1976 22 p

(Contracts NAS5-23119; NAS5-23183)

(NASA-Case-GSC-12053-1; US-Patent-Appl-SN-667930) Avail: NTIS HC $3.50 CSCL 20E

A wideband heterodyne receiver for a laser communication system is disclosed which includes a front end with a cooled photomixer contained in a hermetically sealed space quality housing designed for wide bandwidth transmission. The photomixer is coupled through a wideband preamplifier to the receiver back end which includes a frequency tracking network and demodulating equipment. The receiver is capable of tracking a doppler frequency shift of 750 MHz, positive or negative, and has an instantaneous intermediate frequency information bandwidth of 400 MHz. The receiver system is also capable of

operating over a wide temperature range and is designed to be suitable for use in outer space communication. NASA

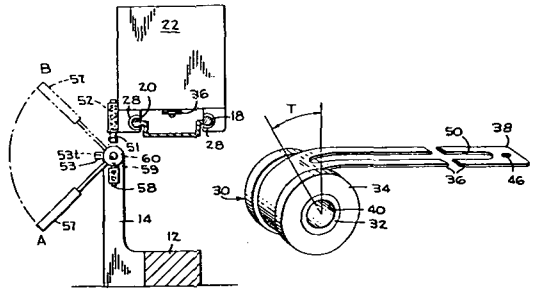


37 MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

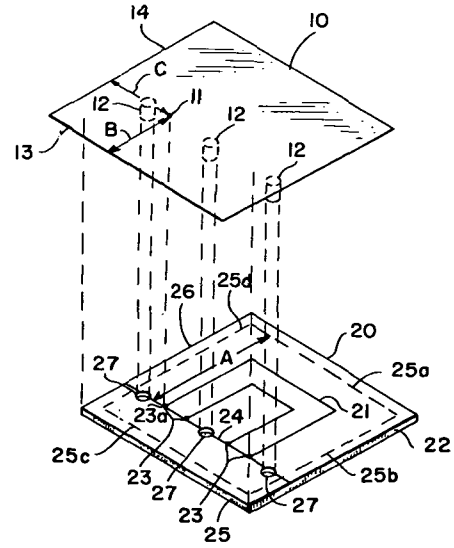
N76-11441*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SPRING OPERATED ACCELERATOR AND CONSTANT FORCE SPRING MECHANISM THEREFOR Patent Application
George L. Shillinger, Jr., inventor (to NASA) Filed 24 Oct. 1975 30 p
(NASA-Case-ARC-10898-1; US-Patent-Appl-SN-625732) Avail: NTIS HC $4.00 CSCL 13I

A spring assembly is described which consists of an elongate piece of flat spring material formed into a spiral and a free running spool. The spring has a distal end that is externally accessible so that when it is drawn along a path, the spring unwinds against a restoring force present in the portion of the spring between the relatively straight condition on the path and a fully wound condition on the spool. When the distal end is released, it is accelerated toward the spool by the force existing at the transition region. In one case, an accelerator may have a carriage for a test load and a pair of the spring assemblies installed to bias the carriage toward the center of a linear path. To cause the carriage to oscillate in a pattern of constant accelerations, the carriage is displaced to a position toward one end of the path and released, whereupon the springs cause the carriage and the load to be accelerated in reciprocation on the path. NASA



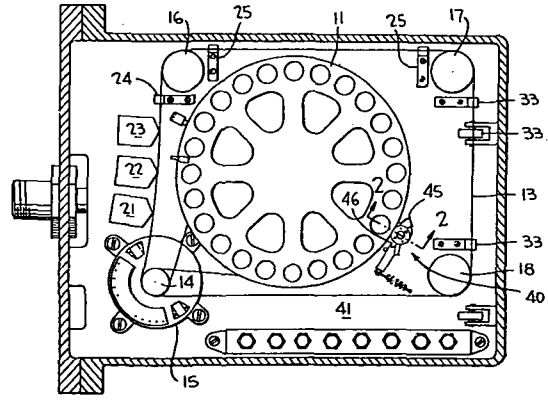
N76-13494*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
PRECISION ALINEMENT APPARATUS FOR CUTTING A WORKPIECE Patent Application
Morriss L. Holliday, inventor (to NASA) Filed 24 Oct. 1975 9 p
(NASA-Case-LAR-11658-1; US-Patent-Appl-SN-625729) Avail: NTIS HC $3.50 CSCL 13I

A fixture is removably affixed to a workpiece thereby providing a temporary reference edge positioned parallel to a reference line and a known distance from a reference point on the workpiece. The temporary reference edge in cooperation with a guide and a cutting blade of a cutting table enables the workpiece to be accurately cut with respect to the reference line and reference point without first having to cut a reference edge on the workpiece. NASA



N76-13495*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
REEL SAFETY BRAKE Patent Application
Clinton E. Carle, inventor (to NASA) Filed 6 Nov. 1975 24 p
(NASA-Case-GSC-11960-1; US-Patent-Appl-SN-629456) Avail: NTIS HC $3.50 CSCL 13I

Brake mechanisms for reel-to-reel tape transport devices is reported, wherein a brake means is mechanically coupled to the hub of each reel by connection to a feeler means sensing the tape being fully wound on either one of the reels. NASA



N76-13496*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

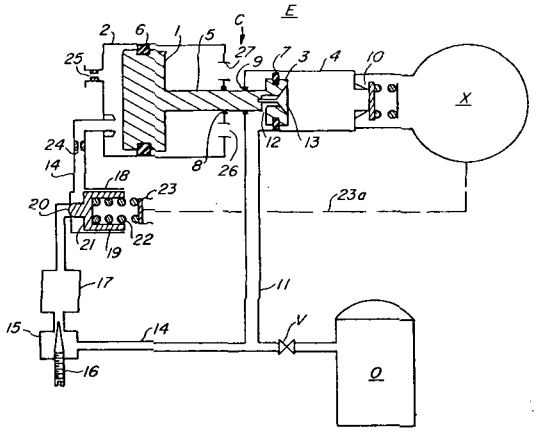
GAS COMPRESSION ANALYSIS Patent Application

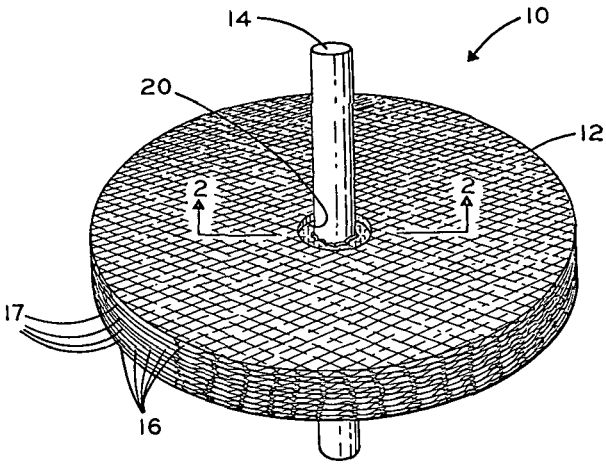
Lee S. Terp, inventor (to NASA) (Garrett Corp., Los Angeles) Filed 24 Oct. 1975 17 p

(Contract NAS9-10465)

(NASA-Case-MSC-14757-1; US-Patent-Appl-SN-625734) Avail: NTIS HC $3.50 CSCL 13I

An apparatus is described for transferring gas from a first container to a second container of higher pressure; it consists of a free-piston compressor having a driving piston and cylinder, a smaller diameter driven piston and cylinder, and a rod member connecting the driving and driven pistons for mutual reciprocation in their respective cylinders. A conduit may be provided for supplying gas to the driven cylinder from the first container. Also provided is control apparatus for intermittently introducing gas to the driving piston, from the first container, to compress gas by the driven piston for transfer to the second higher pressure container. NASA





N76-14460* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

EXTERNALLY SUPPORTED INTERNALLY STABILIZED FLEXIBLE DUCT JOINT Patent

James R. Rollins, inventor (to NASA) (Rockwell Intern. Corp., Canoga Park, Calif.) Issued 28 Oct. 1975 6 p Filed 27 Jun. 1974 Supersedes N74-34882 (12 - 24, p 2951) Sponsored by NASA

(NASA-Case-MFS-19194-1; US-Patent-3,915,482; US-Patent-Appl-SN-483850; US-Patent-Class-285-226; US-Patent-Class-285-265) Avail: US Patent Office CSCL 13E

An externally supported, internally-stabilized flexible duct joint is described which is particularly suited for use in conducting the flow of fluid between a pair of tubular conduits, at least one of which is supported for motion relative to the other. The joint is characterized by a low-flow loss coefficient and includes a pair of coaxially related terminal sleeves adapted to be coupled with adjacently disposed conduits, and an elongated bellows extended between the terminal sleeves. The bellows is supported against thrust induced extension by linkage including a gimbal ring concentrically related to the mid-span of the bellows and a pair of terminal supports affixed to the terminal sleeves and journaled to the gimbal ring. A bellows stabilizing sleeve is disposed within the bellows for avoiding flow impingement and preventing lateral shifting; a support ring is mounted on the stabilizing sleeve and connected to the mid-span of the bellows for connecting the bellows with the stabilizing sleeve.

Official Gazette of the U.S. Patent Office

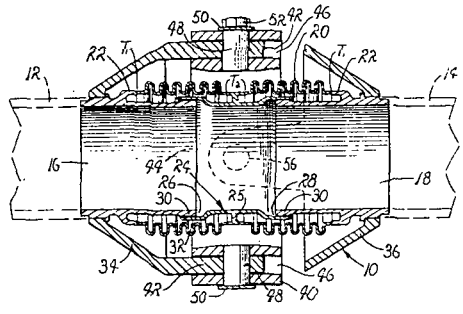
N76-13500*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

AN IMPROVED ROTATABLE MASS FOR A FLYWHEEL Patent Application

George M. Weyler, Jr., inventor (to NASA) Filed 14 Nov. 1975 10 p

(NASA-Case-MFS-23051-1; US-Patent-Appl-SN-632111) Avail: NTIS HC $3.50 CSCL 20K

An improved rotatable mass adapted to be used as a flywheel in energy storage devices is reported. The flywheel is characterized by a plurality of coaxially aligned, contiguous disks mounted on a spin shaft. Each disk is formed of a plurality of woven fibers disposed in a plane transversely related to an axis of rotation with the fibers of alternate disks being continuous throughout their length. The midportion of the fibers of the remaining disks is removed for defining annular voids concentrically related to the spin shaft. NASA



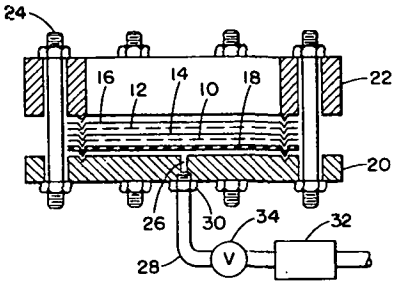
N76-14461* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

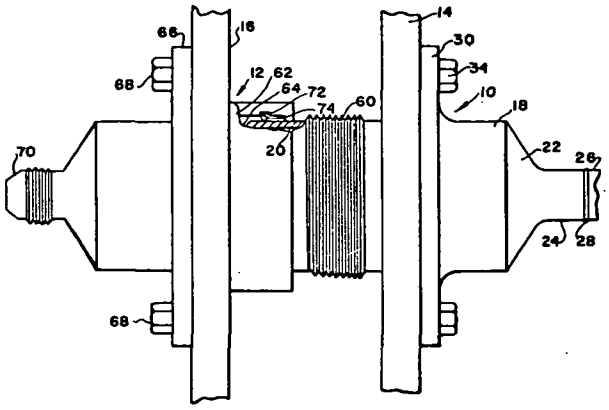
APPARATUS FOR FORMING DISHED ION THRUSTER GRIDS Patent

Bruce A. Banks, inventor (to NASA) Issued 28 Oct. 1975 5 p Filed 22 Apr. 1974 Supersedes N74-22147 (12 - 13, p 1561) Division of US Patent Appl. SN-352381, filed 18 Apr. 1973, US-Patent-3,864,797

(NASA-Case-LEW-11694-2; US-Patent-3,914,969; US-Patent-Appl-SN-462903; US-Patent-Class-72-63; US-Patent-Class-72-363; US-Patent-Class-29-421; US-Patent-Class-72-54; US-Patent-Appl-SN-352381; US-Patent-3,864,797) Avail: US Patent Office CSCL 13H

The patent of an invention dealing with an apparatus for forming dished ion thruster grids was reported. The apparatus consists in an assembly of grid blanks which is separated and covered by impervious metal sheets. The assembly is placed on top of an elastic sheet, and the assembled sheets are clamped at their edges, preventing random slippage and forming an expansible fluid chamber. Pressurized fluid in this chamber inflates the elastic sheet which, in turn, forces the impervious sheets and grid blanks to dish to their natural contour which is approximately hemispheroidal. The impervious sheet between the grid blanks prevents distortion caused by slight misalignment of the holes in the screen and accelerator grids. The dished grids are stress relieved simultaneously in matched dies. Author





N76-15457* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

REMOTELY OPERABLE ARTICULATED MANIPULATOR Patent

Ray E. Marlow, inventor (to NASA) (Sperry Rand Corp., Huntsville, Ala.) Issued 2 Dec. 1975 8 p Filed 23 Dec. 1974 Supersedes N75-14131 (13 - 05, p 0537) Sponsored by NASA

(NASA-Case-MFS-22707-1; US-Patent-3,922,930; US-Patent-Appl-SN-535410; US-Patent-Class-74-665B; US-Patent-Class-74-384; US-Patent-Class-214-1R) Avail: US Patent Office CSCL 13I

An improved, remotely operable, articulated manipulator is described which includes a plurality of serially connected drive shafts and a grasping device mounted at the distal end of the ultimate drive shaft of a plurality of drive shafts. A plurality of joints includes meshed bevel gears interconnecting the drive shafts, whereby rotary motion is imparted to the grasping device in response to rotation imparted to the drive shafts. Drive tubes concentrically related to the drive shafts impart angular displacement to the drive shafts about axes normally related to the longitudinal axes. A differential includes a multiplicity of driver inputs for selectively rotating the drive shafts and drive tubes about their longitudinal axis.

Official Gazette of the U.S. Patent Office

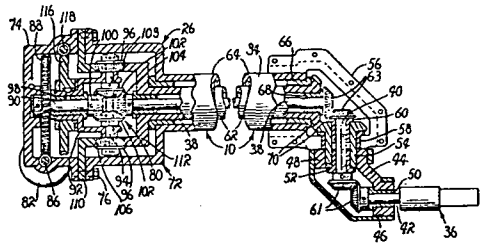
N76-14463* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

QUICK DISCONNECT FILTER COUPLING Patent

Fred Jankowski, inventor (to NASA) Issued 7 Oct. 1975 5 p Filed 30 May 1974 Supersedes N74-26988 (12 - 16, p 1923)

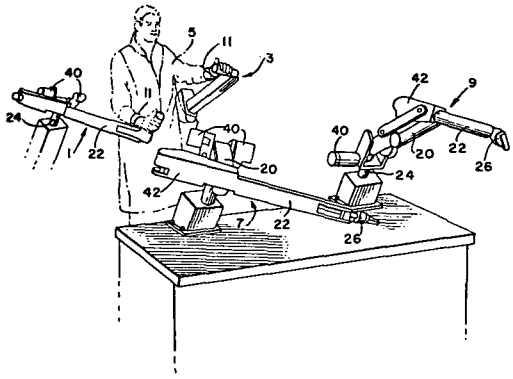
(NASA-Case-MFS-22323-1; US-Patent-3,910,307; US-Patent-Appl-SN-474745; US-Patent-Class-137-515.3; US-Patent-Class-137-550; US-Patent-Class-251-149.6; US-Patent-Class-210-429) Avail: US Patent Office CSCL 13E

A quick disconnect filter coupling is described for use in coupling a pair of lines together through which fluid passes. The device includes a male cylindrical housing having an enlarged longitudinal bore into which a filter cartridge is removably carried. The filter cartridge includes a filter medium and a check valve. A purge assembly can be attached to the male cylindrical housing for flushing with a cleansing fluid when changing the filter cartridge. Official Gazette of the U.S. Patent Office



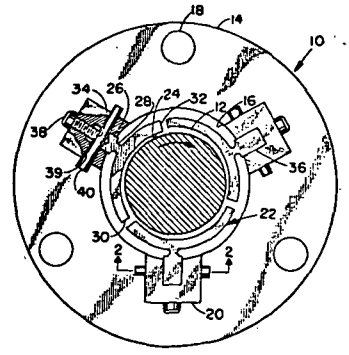
N76-15460* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
REMOTE MANIPULATOR SYSTEM Patent
Donald A. Kugath (GE, Schenectady, N. Y.), Dan H. Dane (GE, Schenectady, N. Y.), and Herman T. Blaise, inventors (to NASA) (GE, Schenectady, N. Y.) Issued 2 Dec. 1975 6 p Filed 11 Oct. 1973 Supersedes N74-10099 (12 - 01, p 0013) Sponsored by NASA
(NASA-Case-MFS-22022-1; US-Patent-3,923,166; US-Patent-Appl-SN-405341; US-Patent-Class-214-1CM) Avail: US Patent Office CSCL 13I

A master-slave manipulator system is described which has two master units controlled by the two arms and hands of an operator and two corresponding slave units. Both the master and the slave units have a first arm rotably mounted to the floor at 30 deg from the vertical, a second arm pivoted to it and mounted for rotation, and a third arm pivoted to the second arm. The slave has a pivotally and rotatably mounted gripper unit with manual master has a pivotally mounted gripper unit with manual switch controls. The servomechanism system includes a solid-state control circuit, and flat, helically wound, internal ribbons of wires.
Official Gazette of the U.S. Patent Office



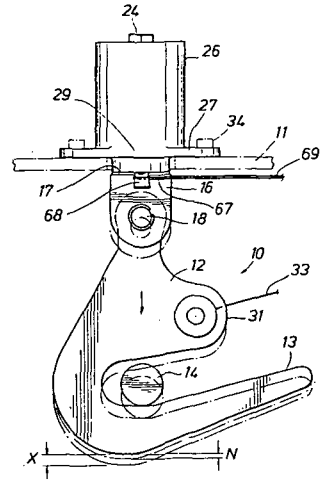
N76-15461* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
FLUID JOURNAL BEARINGS Patent
Frederick T. Schuller and Warren A. Moore, inventors (to NASA) Issued 16 Dec. 1975 4 p Filed 25 Feb. 1974 Supersedes N74-18134 (12 - 09, p 1055) Division of US Patent Appl. SN-346483, filed 30 Mar. 1973, US-Patent-3,830,552, which is a Division of US Patent Appl. SN-238264, filed 27 Mar. 1972, US-Patent-3,804,472
(NASA-Case-LEW-11076-4; US-Patent-3,926,482; US-Patent-Appl-SN-445178; US-Patent-Class-308-9; US-Patent-Class-308-72; US-Patent-Class-308-73; US-Patent-Class-308-122; US-Patent-Class-308-160; US-Patent-Appl-SN-346483; US-Patent-3,830,552; US-Patent-Appl-SN-238264; US-Patent-3,804,472) Avail: US Patent Office CSCL 13T

A plurality of bearing sectors are mounted on a housing. The sectors function as lobed areas in the bearing to obtain the required lubricant film geometry. Each sector has a pad flexibly mounted on a base with a thin neck which forms a pivot.
Official Gazette of the U.S. Patent Office



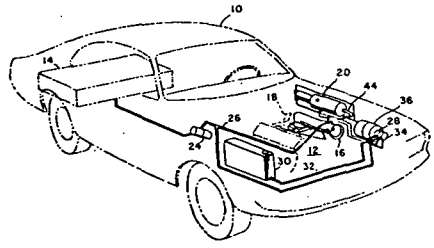
N76-15463*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
LOAD REGULATING LATCH Patent Application
Walter T. Appleberry, inventor (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Filed 18 Dec. 1975 20 p
(Contract NAS9-14000)
(NASA-Case-MSC-19535-1; US-Patent-Appl-SN-641784) Avail: NTIS HC $3.50 CSCL 13E

A load regulating mechanical latch is reported that has a pivotally mounted latch element with a hook shaped end and a strike roller engaging laterally open hook for engaging a stationary strike roller. The latch element or hook is pivotally mounted in a clevis end of an elongated latch stem that is adapted for axial movement through an opening in a support plate or bracket mounted to a structural member. A coil spring is disposed over and around the extending latch stem and the lower end of the coil spring engages the support bracket. A thrust washer is removably attached to the other end of the latch stem and engages the other end of the coil spring and compresses the coil spring thereby preloading the spring and the latch element carried by the latch stem.
NASA



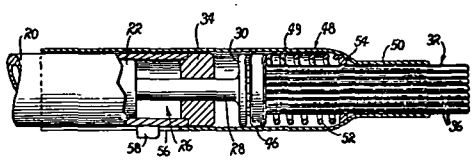
N76-16446*# National Aeronautics and Space Administration. Pasadena Office, Calif.
HYDROGEN RICH GAS GENERATOR Patent Application
John Houseman (JPL), Jack H. Rupe (JPL), and Raymond O. Kushida, inventors (to NASA) (JPL) Filed 20 Aug. 1973 25 p (Contract NAS7-100)
(NASA-Case-NPO-13342-1; US-Patent-Appl-SN-390049) Avail: NTIS HC $3.50 CSCL 13F

A process and apparatus is described for producing a hydrogen rich gas from liquid hydrocarbons and water by means of the steam reforming process using a partial oxidation approach.
NASA



N76-18454* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF PEENING AND PORTABLE PEENING GUN Patent
Vincent P. Caruso and Elbert J. Minter, inventors (to NASA) Issued 10 Feb. 1976 5 p Filed 6 Nov. 1974 Supersedes N75-10459 (13 - 01, p 0061)
(NASA-Case-MFS-23047-1; US-Patent-3,937,055; US-Patent-Appl-SN-521602; US-Patent-Class-73-399; US-Patent-Class-29-81D; US-Patent-Class-72-453; US-Patent-Class-173-132) Avail: US Patent Office CSCL 13H

An improved portable peening gun is reported that is characterized by a pneumatic motor, an axially reciprocable hammer supported to be driven by the motor from an initial position along a linear path, and an improved peening head including an axially reciprocable rod bundle co-axially aligned with the hammer and disposed within the path thereof. The improved head includes a plurality of peening rods, each being characterized by an anvil defined at one end thereof for receiving the hammer in impacting engagement, and a peening surface defined at the other end of a configuration substantially conforming to a segment of a sphere having a radius substantially equal to one half the thickness of the rod, a barrel for supporting the rod bundle for axial reciprocation, and a helical spring disposed within the barrel for urging the bundle in displacement toward its initial position. Official Gazette of the U.S. Patent Office

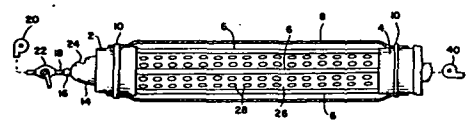


N76-18455* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
METHOD OF FLUXLESS BRAZING AND DIFFUSION BONDING OF ALUMINUM CONTAINING COMPONENTS Patent
Aleck B. Featherston (LTV Aerospace Corp., Dallas) and Kent P. OKelly, inventors (to NASA) (LTV Aerospace Corp., Dallas) Issued 10 Feb. 1976 6 p Filed 12 Mar. 1974 Supersedes N74-20071 (12 - 11, p 1297) Sponsored by NASA
(NASA-Case-MSC-14435-1; US-Patent-3,937,387; US-Patent-Appl-SN-450500; US-Patent-Class-228-193; US-Patent-Class-228-206; US-Patent-Class-228-214; US-Patent-Class-228-238) Avail: US Patent Office CSCL 13H

A method of diffusion bonding and fluxless brazing of aluminum containing components is reported. The aluminum surfaces are freed of any aluminum oxide coating and are coated with a polymeric sealer which can be thermally removed leaving essentially no residue. The polymeric sealer is being removed in a substantially oxygen free environment, and the aluminum components are then being brazed or diffusion bonded without the use of a flux to remove oxide coating.
Official Gazette of the U.S. Patent Office

N76-18456* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
METHOD AND APPARATUS FOR FLUFFING, SEPARATING, AND CLEANING FIBERS Patent
Dan Padilla, inventor (to NASA) (Martin-Marietta Corp., Denver) Issued 10 Feb. 1976 4 p Filed 12 Mar. 1974 Supersedes N74-20072 (12 - 11, p 1298) Sponsored by NASA
(NASA-Case-LAR-11224-1; US-Patent-3,937,661; US-Patent-Appl-SN-450502; US-Patent-Class-209-250; US-Patent-Class-19-205; US-Patent-Class-134-21; US-Patent-Class-134-37; US-Patent-Class-209-300; US-Patent-Class-209-305) Avail: US Patent Office CSCL 13I

A perforated tube is housed in a chamber in which vacuum is drawn. An air jet is directed into one end of the tube and fiber bundles are fed into the jet which separates and dispenses individual fibers from the bundle, fluffs them, cleanses them of any particulate material, and carries them into the tube. The tube retains the fibers while fiber fragments, undesirably short fibers and particulate matter are drawn by the vacuum and resultant air flow out of the tube through its perforations to a suitable discharge. Official Gazette of the U.S. Patent Office

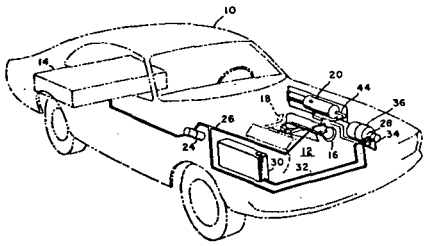


N76-18457* National Aeronautics and Space Administration. Pasadena Office, Calif.
SYSTEM FOR MINIMIZING INTERNAL COMBUSTION ENGINE POLLUTION EMISSION Patent
Jack H. Rupe, inventor (to NASA) (JPL) Issued 23 Sep. 1975 12 p Filed 10 Aug. 1973 Sponsored by NASA
(NASA-Case-NPO-13402-1; US-Patent-3,906,913; US-Patent-Appl-SN-387342; US-Patent-Class-123-121;

US-Patent-Class-123-DIG.12; US-Patent-Class-123-119E; US-Patent-Class-123-120; US-Patent-Class-123-89a) Avail: US Patent Office CSCL 21A

A mixing device is provided for an internal combustion engine which simultaneously atomizes liquid fuel, mixes this fuel with an optimal quantity of hydrogen and combines this mixture with a prescribed quantity of air. A throttling mechanism controls the fuel delivery to the engine and also limits the fuel to air equivalence ratio to be predetermined upper bound to inhibit the production of air pollutants and to a lower bound which is above the lean flammability of the mixture.

Official Gazette of the U.S. Patent Office

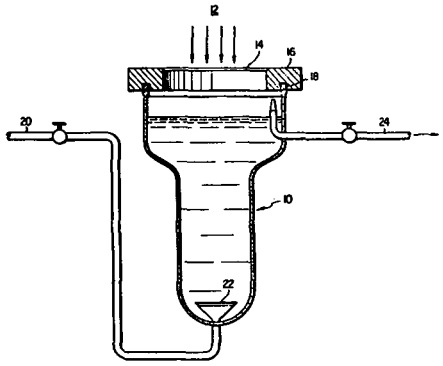


N76-18458* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

PROCESS FOR MAKING ANHYDROUS METAL HALIDES Patent

Warren H. Philipp, Stanley J. Marsik, and Charles E. May, inventors (to NASA) Issued 17 Feb. 1976 5 p Filed 27 Nov. 1974 Supersedes N75-13053 (13 - 04, p 0396)
(NASA-Case-LEW-11860-1; US-Patent-3,939,048; US-Patent-Appl-SN-527728; US-Patent-Class-204-157.1H; US-Patent-Class-250-527) Avail: US Patent Office CSCL 13H

A process for the preparation and isolation of high purity anhydrous lower valence state metal halides is reported that dissolves the corresponding higher valence state metal halide in an organic liquid, which is selected such that the higher valence state metal halide is soluble therein and the lower valence state metal halide is insoluble therein. Subjecting the solution to high energy radiation reduces the higher valence state metal halide to its corresponding lower valence state metal halide, at a temperature in the range of from about 0 C to about room temperature. Official Gazette of the U.S. Patent Office

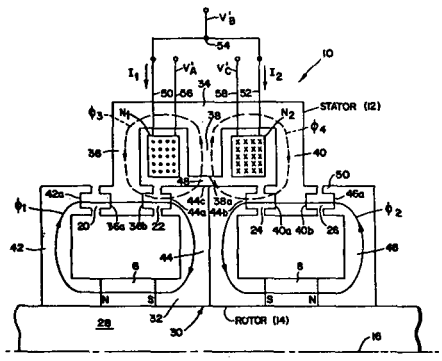


N76-18459* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

AXIALLY AND RADIALLY CONTROLLABLE MAGNETIC BEARING Patent

Leo Veillette, inventor (to NASA) Issued 10 Feb. 1976 10 p Filed 8 Feb. 1974 Supersedes N74-18132 (12 - 09, p 1055)
(NASA-Case-GSC-11551-1; US-Patent-3,937,533; US-Patent-Appl-SN-440917; US-Patent-Class-308-10) Avail: US Patent Office CSCL 13I

An axially controllable magnetic bearing apparatus is described which provide 2 radial stiffness force control between a rotor and stator. The bearing is composed of a pair of axially spaced air gaps defined by corresponding pairs of annular pole pieces of the rotor and stator. Permanent magnets carried by the rotor generate constant axial bias fluxes in each of the air gaps. A pair of coils, disposed to axially excite the air gaps with variable flux, are driven in a manner so that the sum of the total fluxes in each of the air gaps is varied to change the radial stiffness between the bearing rotor and stator. Axial force between the rotor and stator is produced by exciting the two coils to vary the difference of the total air gap fluxes. The pair of coils are driven in a bridge circuit by pulse-width modulated signals. Official Gazette of the U.S. Patent Office

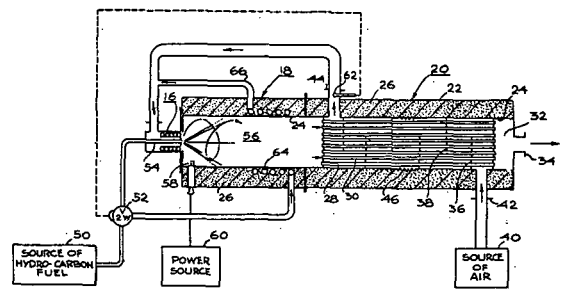


N76-18460*# National Aeronautics and Space Administration. Pasadena Office, Calif.

HYDROGEN-RICH GAS GENERATOR Patent Application

John Houseman (JPL) and Donald J. Cerini, inventors (to NASA) (JPL) Filed 10 Jul. 1974 27 p Sponsored by NASA
(NASA-Case-NPO-13560; NASA-Case-NPO-13561-1; US-Patent-Appl-SN-487156) Avail: NTIS HC $4.00 CSCL 13F

A process and apparatus are described for producing hydrogen-rich gas from liquid hydrocarbon and air. The proposed gas generator is portable and produces soot-free hydrogen-rich gas preventing clogging of the carburetor of the internal combustion engine using the product gas. The use of water or steam in the process is eliminated. NASA



N76-19436* National Aeronautics and Space Administration. *Marshall Space Flight Center, Huntsville, Ala.*

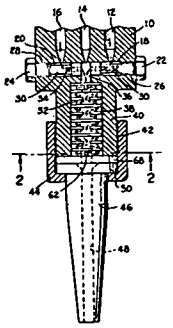
MIXING INSERT FOR FOAM DISPENSING APPARATUS Patent

William G. Simpson, inventor (to NASA) Issued 2 Mar. 1976 4 p Filed 12 Jun. 1974 Supersedes N74-26989 (12 - 16, p 1924)

(NASA-Case-MFS-20607-1; US-Patent-3,941,355; US-Patent-Appl-SN-478800; US-Patent-Class-259-4AC; US-Patent-Class-222-145) Avail: US Patent Office CSCL 13G

A device for mixing foam ingredients is described. The device comprises an arrangement of lands situated about a cylindrical elongated shaft-like member with each land having a slot. The slots of alternate lands are positioned 180 deg from each other so that as the ingredients flow through the mixing chamber they flow from adjacent one side of the housing to the other dividing as such passes around the shaft-like member.

Official Gazette of the U.S. Patent Office



N76-19437* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

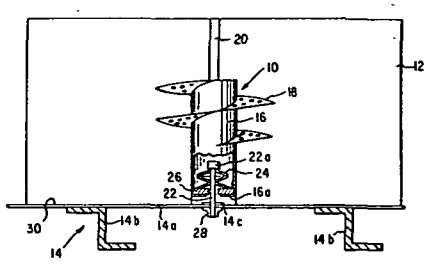
AUGER ATTACHMENT METHOD FOR INSULATION Patent

William C. Schneider, inventor (to NASA) Issued 10 Feb. 1976 4 p Filed 24 Jul. 1974 Supersedes N74-30916 (12 - 20, p 2439)

(NASA-Case-MSC-12615-1; US-Patent-3,936,927; US-Patent-Appl-SN-491417; US-Patent-Class-29-526; US-Patent-Class-29-432; US-Patent-Class-29-433; US-Patent-Class-52-705; US-Patent-Class-52-758F; US-Patent-Class-244-117A; US-Patent-Class-244-163) Avail: US Patent Office CSCL 13E

An auger device is used to attach rigidized surface insulation to a spacecraft. The auger is preferably screwed into an insulation tile which has been predrilled. The augertile combination is then fastened to the spacecraft using an attachment screw which penetrates the spacecraft skin and which is secured by a blind end fastener. In an alternate method, the auger is incorporated in the insulation tile when the latter is fabricated.

Official Gazette of the U.S. Patent Office



N76-19439*# National Aeronautics and Space Administration. *Lyndon B. Johnson Space Center, Houston, Tex.*

MECHANICAL SEQUENCER Patent Application

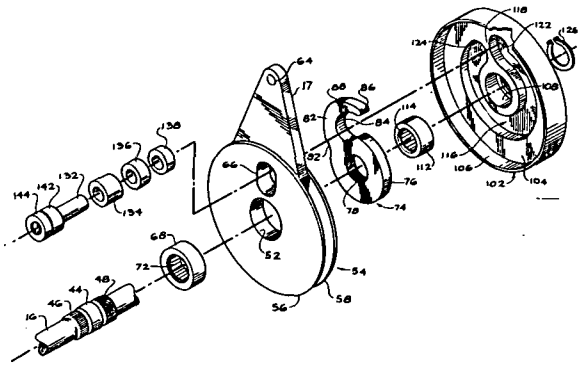
Walter T. Appleberry, inventor (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Filed 17 Feb. 1976 29 p

(Contract NAS9-1400)

(NASA-Case-MSC-19536-1; US-Patent-Appl-SN-658450) Avail: NTIS HC $4.00 CSCL 13I

A mechanical sequencer having a rotatable drive shaft is described. The drive shaft has a spline formed. A freely rotatable shaft contains a plurality of rollers, the axis of the freely rotatable shaft having an axis parallel to and offset from the axis of the drive shaft. A drive fitting has an opening, the drive fitting being positioned on the drive shaft spline for rotating the fitting with the shaft. A finger is formed integral with the drive fitting for enabling the fitting to move the rollers and the freely rotatable shaft. A crank structure is positioned in a plane perpendicular to the axis of the drive shaft and the freely rotatable shaft. The crank structure has a drive shaft opening through which the drive shaft passes.

NASA



N76-19440*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

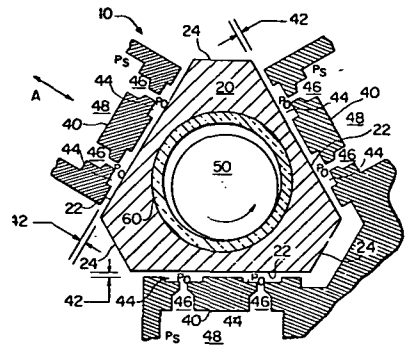
HYDROSTATIC BEARING SUPPORT Patent Application

R. E. Cunningham, inventor (to NASA) Filed 2 Mar. 1976 12 p

(NASA-Case-LEW-11158-1; US-Patent-Appl-SN-663008) Avail: NTIS HC $3.50 CSCL 13I

A hydrostatic bearing support system is provided which comprises a bearing housing having a polygonally configured outer surface which defines at least three symmetrically disposed working faces and a plurality of pressure plates, each of which is disposed relatively opposite a corresponding working face and spaced therefrom to define a gap there between. A hydrostatic support film is created in the gap for supporting the housing in spaced relationship to the pressure plates.

NASA



N76-20480* National Aeronautics and Space Administration. Pasadena Office, Calif.

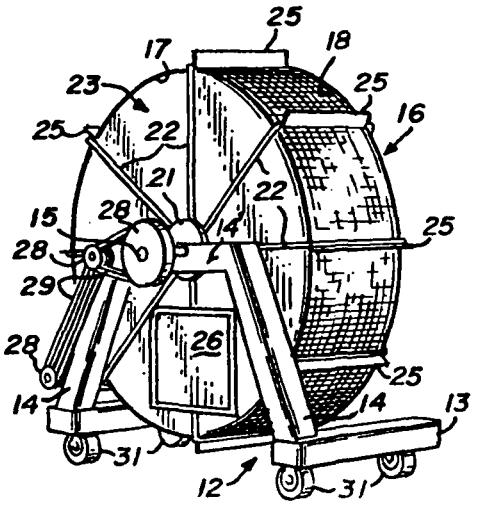
ZERO TORQUE GEAR HEAD WRENCH Patent

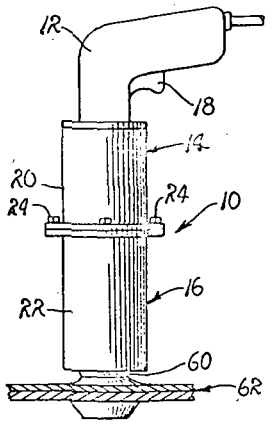
Allan R. McDougal (JPL) and Robert M. Norman, inventors (to NASA) (JPL) Issued 9 Mar. 1976 6 p Filed 10 Oct. 1974 Sponsored by NASA

(NASA-Case-NPO-13059-1; NASA-Case-NPO-13436-1; US-Patent-3,942,398; US-Patent-Appl-SN-513690; US-Patent-Class-81-56; US-Patent-Class-81-57.31) Avail: US Patent Office CSCL 13I

A gear head wrench particularly suited for use in applying torque to bolts without transferring torsional stress to bolt-receiving structures is introduced. The wrench is characterized by a coupling including a socket, for connecting a bolt head with a torque multiplying gear train, provided within a housing having an annulus concentrically related to the socket and adapted to be coupled with a spacer interposed between the bolt head and the juxtaposed surface of the bolt-receiving structure for applying a balancing counter-torque to the spacer as torque is applied to the bolt head whereby the bolt-receiving structure is substantially isolated from torsional stress. As a result of the foregoing, the operator of the wrench is substantially isolated from any forces which may be imposed.

Official Gazette of the U.S. Patent Office





N76-20485*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

TREAD DRUM FOR ANIMALS Patent Application

Wayne H. Howard, inventor (to NASA) Filed 31 Mar. 1976 13 p

(NASA-Case-ARC-10917-1; US-Patent-Appl-SN-672223) Avail: NTIS HC $3.50 CSCL 13I

A tread drum is described for animals, such as primates. It includes a cylindrical housing mounted for rotation about a horizontal axis of revolution with a cylindrical treadway portion on which the animal treads while the drum is rotated by a motorized drive. The treadway portion of the drum includes an electrode structure with sectors independently energizable by a commutator and source of potential, so that an electrical shock station is created behind a running-in-place station on the moving treadway. In this manner, if the animal should fall behind its running-in-place station, it may be shocked by treading on the energized electrode structure. One end of the tread drum comprises a transparent wall for unobstructed viewing of the animal being exercised. NASA

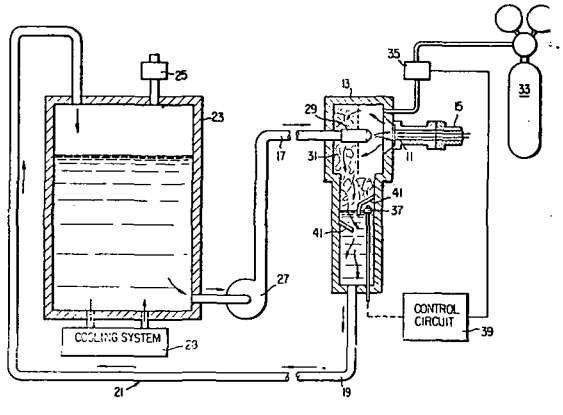
N76-20486*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

***CLOSED LOOP SPRAY COOLING APPARATUS* Patent Application**

Donald L. Alger, William Schwab, and Edward R. Furman, inventors (to NASA) Filed 31 Mar. 1976 11 p

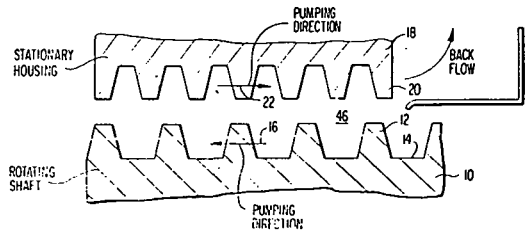
(NASA-Case-LEW-11981-1; US-Patent-Appl-SN-672220) Avail: NTIS HC $3.50 CSCL 13I

A closed loop apparatus for spraying coolant against the back of a radiation target is described. The coolant is circulated through a closed loop with a bubble of inert gas being maintained around the spray. Mesh material is disposed between the bubble and the surface of the liquid coolant which is below the bubble at a predetermined level. In a second embodiment no inert gas is used, the bubble consisting of vapor produced when the coolant is sprayed against the target. NASA



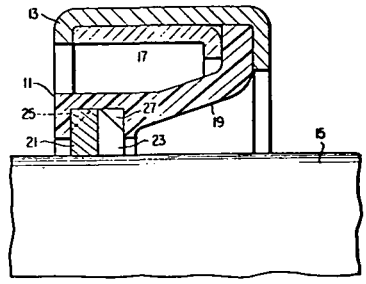
N76-20487*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COUNTER PUMPING DEBRIS EXCLUDER AND SEPARATOR Patent Application
Lawrence P. Ludwig, inventor (to NASA) Filed 31 Mar. 1976 13 p
(NASA-Case-LEW-11855-1; US-Patent-Appl-SN-672222) Avail: NTIS HC $3.50 CSCL 13I

A dirt separator and excluder is described for removing entrained debris from gas turbine shaft seals. A helical groove pattern is constructed on the rotating shaft with the pumping pattern such that it tends to pump seal pressurizing gas toward the gas turbine seal. A second helical groove pattern is provided on the stationary housing or counter rotating member coaxial with the shaft, and this pattern is designed to provide pumping in the direction opposite from that of the groove pattern on the shaft. Gas with entrained debris entering this grooved area is subjected to high centrifugal forces due to the swirl motion induced by the groove pattern and the rotation of the shaft. This debris is centrifuged outwardly into the outer groove pattern on the housing or counter rotating member. Since the outer groove pattern has a pumping direction opposite from that of the seal, dirt is pumped away from the seal and collected in a suitable debris trap. NASA



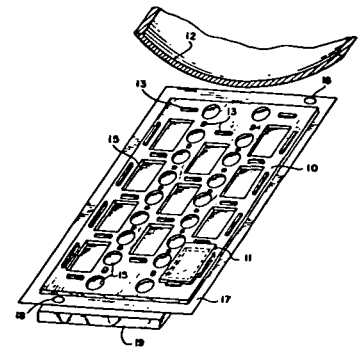
N76-20488*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CIRCUMFERENTIAL SHAFT SEAL Patent Application
L. P. Ludwig, inventor (to NASA) Filed 31 Mar. 1976 9 p
(NASA-Case-LEW-12119-1; US-Patent-Appl-SN-672219) Avail: NTIS HC $3.50 CSCL 11A

A circumferential shaft seal comprising two sealing rings held to a rotating shaft by means of a surrounding elastomeric band is described. The rings are segmented and are of a rigid sealing material such as carbon or a polyimide and graphite fiber composite. NASA



N76-21554* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
APPARATUS FOR POSITIONING MODULAR COMPONENTS ON A VERTICAL OR OVERHEAD SURFACE Patent
Cyrus C. Haynig (Rockwell Intern. Corp., Downey Calif.) and Samuel V. Messineo, inventors (to NASA) (Rockwell Intern. Corp., Downey, Calif.) Issued 23 Mar. 1976 6 p Filed 30 Aug. 1974 Supersedes N74-32926 (12 - 22, p 2701) Sponsored by NASA
(NASA-Case-LAR-11465-1; US-Patent-3,945,879;
US-Patent-Appl-SN-502137; US-Patent-Class-156-556;
US-Patent-Class-33-1G; US-Patent-Class-33-174B;
US-Patent-Class-156-286; US-Patent-Class-156-382;
US-Patent-Class-248-362; US-Patent-Class-248-363;
US-Patent-Class-269-21) Avail: US Patent Office CSCL 13I

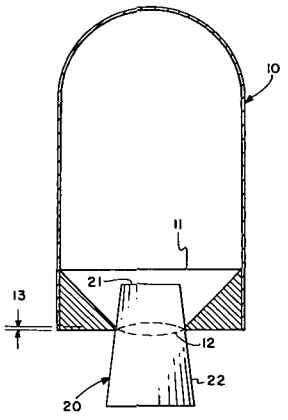
An apparatus is disclosed for holding a plurality of modular components against a surface. A fixture prepositions the components and a vacuum develops a uniform pressure which presses and holds the fixture and objects against a surface. The surface may be curved, vertical, or overhead and since local load concentrations are avoided, fragile ceramic tiles may be installed using the apparatus.
Official Gazette of the U.S. Patent Office



N76-21558*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
[MANUFACTURE OF GLASS-TO-METAL SEALS WHEREIN THE CLEANLINESS OF THE PROCESS IS ENHANCED AND THE LEAK RESISTANCE OF THE RESULTING SEAL IS MAXIMIZED] Patent Application
Ted J. Podgorski, inventor (to NASA) (Honeywell, Inc. Minneapolis, Minn.) Filed 1 Apr. 1976 9 p
(Contract NAS1-11010)
(NASA-Case-LAR-11563-1; US-Patent-Appl-SN-672815) Avail: NTIS HC $3.50 CSCL 11A

A method for making a glass-to-metal seal is disclosed. A domed metal enclosure having a machined seal ring is fitted to a glass post machined to a slight taper and to the desired surface finish. The metal part is then heated by induction in a vacuum. As the metal part heats and expands relative to the glass post, the metal seal ring, possessing a higher coefficient of expansion than the glass post, slides down the tapered post. Upon cooling, the seal ring crushes against the glass post forming the seal. The method results in a glass-to-metal seal with extremely

good leak resistance, while the parts are kept clean and free of contaminants. NASA



39 STRUCTURAL MECHANICS

Includes structural element design and weight analysis; fatigue; and thermal stress.

For applications see *05 Aircraft Design, Testing and Performance* and *18 Spacecraft Design, Testing and Performance.*

N76-17427*# National Aeronautics and Space Administration. Pasadena Office, Calif.

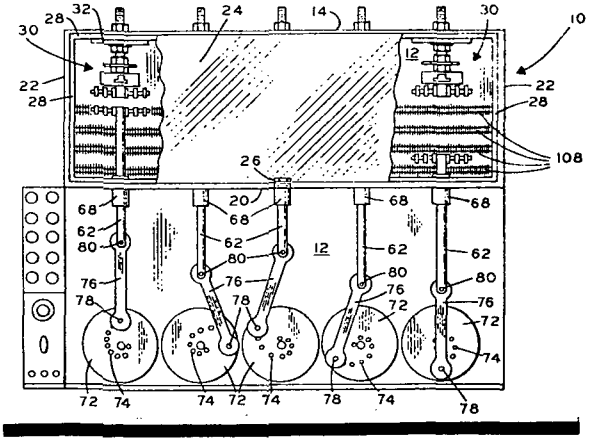
A MACHINE FOR USE IN MONITORING FATIGUE LIFE FOR A PLURALITY OF ELASTOMERIC SPECIMENS Patent Application

George E. Fitzer, inventor (to NASA) (JPL) Filed 29 Jan. 1976 18 p

(Contract NAS7-100)

(NASA-Case-NPO-13731-1; US-Patent-Appl-SN-653681) Avail: NTIS HC $3.50 CSCL 20K

An improved machine for use in determining the fatigue life for elastomeric specimens is disclosed. The machine is characterized by a plurality of juxtaposed test stations, specimen support means located at each of the test stations for supporting a plurality of specimens of elastomeric material, and means for subjecting the specimens at each station to sinusoidal strain. The strain rate is unique with respect to the strain rate at which the specimens at each of the other stations is subjected to sinusoidal strain. NASA



44 ENERGY PRODUCTION AND CONVERSION

Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

N76-10570*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CESIUM THERMIONIC CONVERTERS HAVING LANTHANUM HEXABORIDE ELECTRODES Patent Application

James F. Morris, inventor (to NASA) Filed 16 Oct. 1975 9 p (NASA-Case-LEW-12038-1; US-Patent-Appl-SN-623189) Avail: NTIS HC $3.25 CSCL 10A

A high electric-power output thermionic converter is provided for by the combination of lanthanum hexaboride emitter and collector electrodes in a cesium thermionic converter. The interaction between the lanthanum hexaboride electrodes and cesium vapor which is adsorbed on the lanthanum hexaboride electrodes results in lower emitter and collector work functions to produce a thermionic converter having a high current density and voltage output. The lanthanum hexaboride emitter and collector electrodes employed in the cesium diode may conveniently be either in the monocrystalline or polycrystalline state. NASA

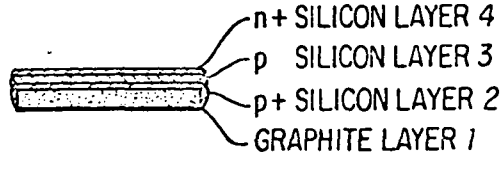
N76-13597*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

LOW COST SUBSTRATES FOR POLYCRYSTALLINE SOLAR CELLS Patent Application

Ting L. Chu, inventor (to NASA) (Southern Methodist Univ.) Filed 12 May 1975 22 p Sponsored by NASA

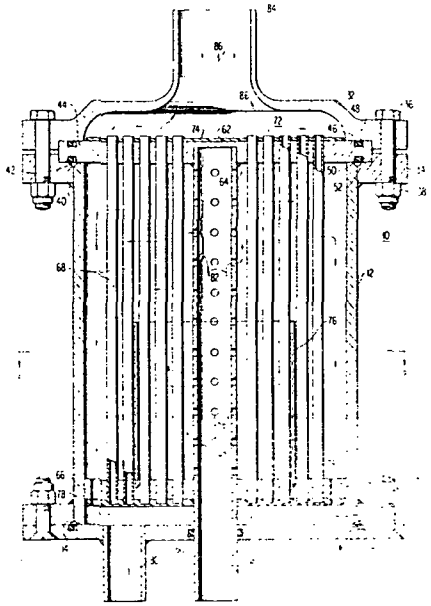
(NASA-Case-GSC-12022-1; NASA-Case-GSC-12023-1; US-Patent-Appl-SN-576488) Avail: NTIS HC $3.50 CSCL 10A

Low-cost polycrystalline silicon solar cells supported on substrates are prepared by depositing successive layers of *polycrystalline silicon containing appropriate dopants over* supporting substrates selected from the group consisting of metallurgical-grade polycrystalline silicon, graphite and steel coated with a diffusion barrier of silica, borosilicate, or phosphosilicate. The p-n junction devices are formed which effectively convert solar energy to electrical energy. NASA



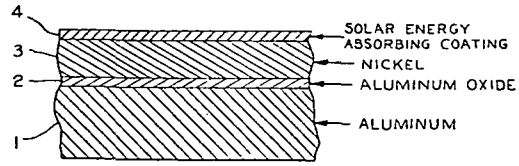
N76-13599*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
TUBULAR SUBLIMATOR/EVAPORATOR HEAT SINK Patent Application
Bruce W. Webbon, inventor (to NASA) Filed 16 Oct. 1975 12 p
(NASA-Case-ARC-10912-1; US-Patent-Appl-SN-623187) Avail: NTIS HC $3.50 CSCL 10C

An evaporative refrigerator or cooler comprising a bundle of spaced porous walled tubes closed at one of their ends and vented to a vacuum at the other end is disclosed. The tube bundle is surrounded by a water jacket having a hot water inlet distribution manifold and a cooled water outlet through a plenum chamber. In operation, hot water is pumped into the jacket to circulate around the tubes, and when this water meets the vacuum existing inside the tubes, it evaporates thereby cooling the water in the jacket. If cooling proceeds to the point where water penetrating or surrounding all or part of the tubes freezes, operation continues with local sublimation of the ice on the tubes while the circulating water attempts to melt the ice. Under some conditions, both sublimation and evaporation may take place simultaneously in different regions of the device. NASA



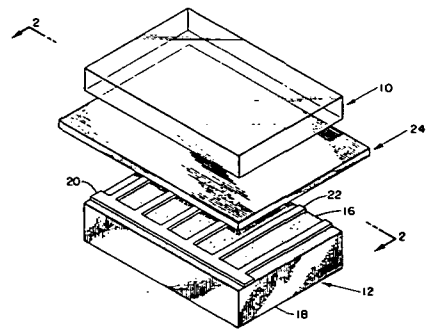
N76-14595* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
PANEL FOR SELECTIVELY ABSORBING SOLAR THERMAL ENERGY AND THE METHOD OF PRODUCING SAID PANEL Patent
James R. Lowery, inventor (to NASA) Issued 18 Nov. 1975 7 p Filed 5 Apr. 1974 Supersedes N74-19700 (12 - 17, p 1249)
(NASA-Case-MFS-22562-1; US-Patent-3,920,413; US-Patent-Appl-SN-458484; US-Patent-Class-29-197; US-Patent-Class-29-194; US-Patent-Class-29-195; US-Patent-Class-126-270; US-Patent-Class-204-32R; US-Patent-Class-204-33; US-Patent-Class-204-38A; US-Patent-Class-204-40; US-Patent-Class-204-42; US-Patent-Class-204-49; US-Patent-Class-136-206) Avail: US Patent Office CSCL 10A

A panel is described for selectively absorbing solar thermal energy comprised of a metallic substrate, a layer of bright metallic material carried on the substrate, and a solar thermal energy absorbing coating carried on the bright metallic material. A layer of zinc is interposed between the metal substrate and the layer of bright material or the metallic substrate can be anodized for receiving the layer of bright metallic material. Also disclosed is the method for producing the coating which selectively absorbs solar thermal energy. Official Gazette of the U.S. Patent Office



N76-14600* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COVERED SILICON SOLAR CELLS AND METHOD OF MANUFACTURE Patent
Jacob D. Broder, inventor (to NASA) Issued 14 Oct. 1975 4 p Filed 18 Jun. 1973 Supersedes N73-26048 (11 - 17, p 1985) Continuation-in-part of abandoned US Patent Appl. SN-154930, filed 21 Jun. 1971
(NASA-Case-LEW-11065-2; US-Patent-3,912,540; US-Patent-Appl-SN-371322; US-Patent-Class-136-89; US-Patent-Class-29-572; US-Patent-Appl-SN-154930) Avail: US Patent Office CSCL 10A

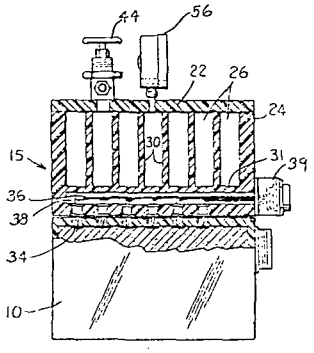
A glass covered solar cell utilizing a thin film of plastic material as the binding material is described. The binding material provides the following characteristics: its short circuit current response is unaffected by ultraviolet radiation exposure and its bonding characteristics are not degraded under particular radiation bombardment. Official Gazette of the U.S. Patent Office



N76-14601* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
RAPID ACTIVATION AND CHECKOUT DEVICE FOR BATTERIES Patent

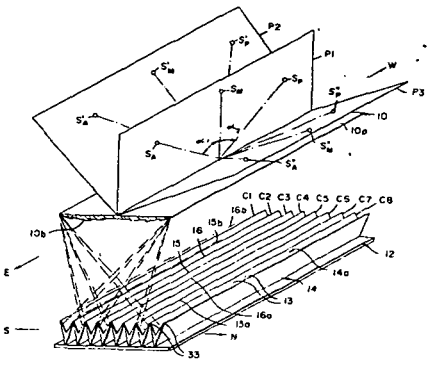
William J. Britz and William A. Boshers, inventors (to NASA) Issued 14 Oct. 1975 6 p Filed 27 Jun. 1974 Supersedes N74-34861 (12 - 24, p 2948)
(NASA-Case-MFS-22749-1; US-Patent-3,912,541; US-Patent-Appl-SN-483857; US-Patent-Class-136-90; US-Patent-Class-136-114; US-Patent-Class-136-162; US-Patent-Class-136-182) Avail: US Patent Office CSCL 10C

An apparatus developed to activate a battery by inserting an electrolyte into the cells while concurrently making voltage measurements on each cell is described. The battery has a planar top with vertically extending passages providing access to the cells. It also has test points adjacent each cell. A housing is mounted on top of the battery for supplying an electrolyte through sealed passages into the cells while simultaneously checking the voltage of the cells. The electrolyte is forced by pressure into the battery. Official Gazette of the U.S. Patent Office



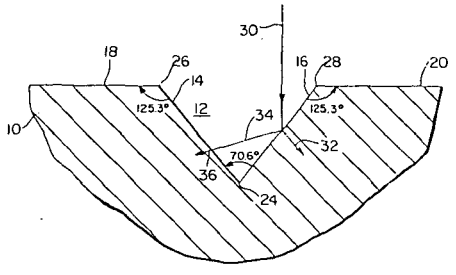
N76-14602* National Aeronautics and Space Administration. Pasadena Office, Calif.
THERMOSTATICALLY CONTROLLED NON-TRACKING TYPE SOLAR ENERGY CONCENTRATOR Patent
Katsunori Shimada, inventor (to NASA) (JPL) Issued 28 Oct. 1975 9 p Filed 22 Nov. 1974 Supersedes N75-12429 (13 - 03, p 0316) Sponsored by NASA
(NASA-Case-NPO-13497-1; US-Patent-3,915,148; US-Patent-Appl-SN-526448; US-Patent-Class-126-271; US-Patent-Class-237-1A; US-Patent-Class-350-211) Avail: US Patent Office CSCL 10A

A solar energy concentrator composed of an array of cylindrical Fresnel lenses, all of which are fixedly aligned in the east-west direction was developed. Each lens concentrates the sun rays and forms a line image which extends in the east-west direction. Located below the lenses are individual fluid channels which extend in the east-west direction and are spaced apart in the south-north direction. Each line image focuses onto not more than two of the channels which absorb heat of the concentrated sun rays. Each channel has a thermostatically controlled valve which controls fluid flow through the channel to take place only when the channel's temperature and/or the fluid exceed a threshold temperature level.
Official Gazette of the U.S. Patent Office



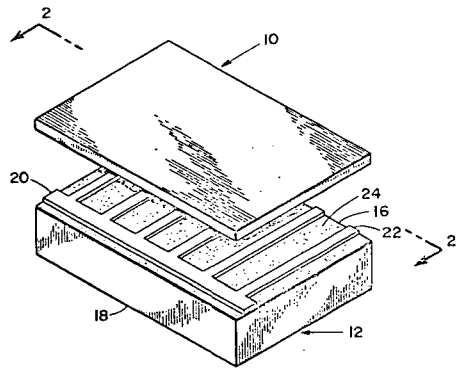
N76-14612*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SOLAR CELL SURFACE TREATMENT Patent Application
Henry W. Brandhorst, Jr. and Cosmo R. Barona, inventors (to NASA) Filed 18 Dec. 1975 13 p
(NASA-Case-LEW-11330-1; US-Patent-Appl-SN-642083) Avail: NTIS HC $3.50 CSCL 10A

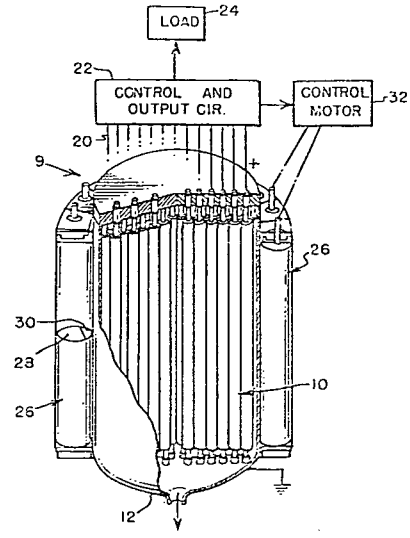
A patent application dealing with an improvement to solar cells was presented. The improvement consists in increasing the anti-reflecting properties of silicon solar cells by the formation of grooves on the surface of the cells using a chemical etchant. The novelty of the invention resides not only in the formation of grooves that produce multiple reflection of light to enhance absorption but also the utilization of internal reflection that takes place as a result of the crystallographic orientation of the solar cell. This results in more charge carriers being generated close to the junction region than is possible with conventional solar cells with normal angles of light incidence. Author



N76-14613*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SILICON NITRIDE COATED, PLASTIC COVERED SOLAR CELL Patent Application
Jacob D. Broder, inventor (to NASA) Filed 30 Dec. 1975 8 p (NASA-Case-LEW-11496-1; US-Patent-Appl-SN-645508) Avail: NTIS HC $3.50 CSCL 10A

A patent application dealing with a technique to increase the resistance to damage to silicon solar cells caused by electron bombardment was presented. A non-oxide anti-reflective coating is used with a transparent plastic cover of fluorinated ethylene propylene copolymer over the solar cell. An important advantage results from the use of silicon nitride as the coating material instead of the conventional silicon oxide. Even if the silicon nitride is as susceptible to fluorine attack as the silicon oxide, the silicon nitride will not liberate oxygen to cause embrittlement of the Teflon FEP cover. Author



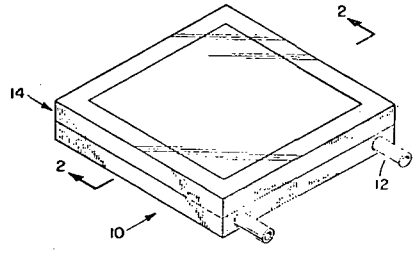


N76-15573*# National Aeronautics and Space Administration. Pasadena Office, Calif.
CONTROL FOR NUCLEAR THERMIONIC POWER SOURCE Patent Application
Craig D. Sawyer, inventor (to NASA) (JPL) Filed 17 Oct. 1975 22 p
(Contract NAS7-100)
(NASA-Case-NPO-13114-2; US-Patent-Appl-SN-634214) Avail: NTIS HC $3.50 CSCL 10B

A control system is presented for a thermionic reactor power source. It maintains a constant load voltage while minimizing emitter temperature variations, in spite of wide and sudden changes in load. The control system includes a neutron flux control circuit, and a separate variable gain power regulator that provides a constant voltage output to the load. The neutron flux control circuit compares the actual neutron flux to a linear function of current supplied by the thermionic converter of the reactor, and uses any difference as an error signal that drives a mechanism which alters the neutron flux. The variable gain regulator always draws enough current from the thermionic converter to supply the load with a constant voltage. Block diagrams of the system are shown. NASA

N76-15603*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SELECTIVE COATING FOR SOLAR PANELS Patent Application
Glen E. McDonald, inventor (to NASA) Filed 22 Dec. 1975 12 p
(NASA-Case-LEW-12159-1; US-Patent-Appl-SN-643041) Avail: NTIS HC $3.50 CSCL 10A

A black chrome coating of controlled thickness (0.5 micron to 2.5 microns) which has improved energy absorbing properties is examined. The coating is deposited on a specially prepared metal substrate, and has high absorptivity for visible solar radiation, and low emissivity for infrared radiation. NASA

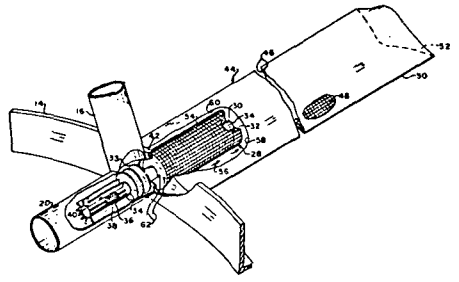


N76-16612* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THERMOELECTRIC POWER SYSTEM Patent
Ambrose W. Byrd, inventor (to NASA) Issued 6 Jan. 1976

5 p Filed 19 Mar. 1974 Supersedes N74-18726 (12 - 10, p 1128)
(NASA-Case-MFS-22002-1; US-Patent-3,931,532; US-Patent-Appl-SN-452769; US-Patent-Class-310-4; US-Patent-Class-136-202; US-Patent-Class-136-210; US-Patent-Class-165-105) Avail: US Patent Office CSCL 10A

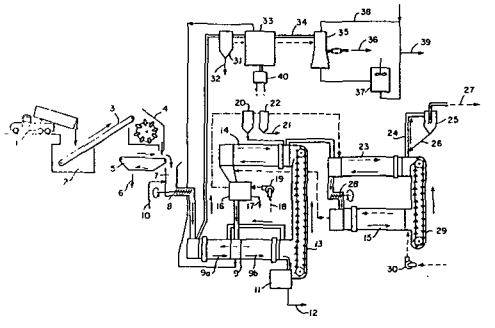
A thermoelectric power system is described which is particularly adaptable for use in outer space. A nuclear reactor heats a working fluid, which in turn supplies heat to a plurality of thermoelectric generators spaced about a ring-shaped support. A first heat pipe is employed to couple heat between the hot fluid and hot junction of the thermoelectric element of each generator, and a second heat pipe couples heat away from the cold junction of each thermoelectric element. Each of the second heat pipes are elongated flexible units adapted to be folded upon launch and thereafter extended in space to provide a substantial area for the radiation of heat to be discharged.

Official Gazette of the U.S. Patent Office



N76-16621*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
PYROLYSIS SYSTEM AND PROCESS Patent Application
Shang-I. Cheng, inventor (to NASA) (Cooper Union) Filed 30 Dec. 1975 16 p Sponsored by NASA
(NASA-Case-MSC-12669-1; US-Patent-Appl-SN-645503) Avail: NTIS HC $3.50 CSCL 10B

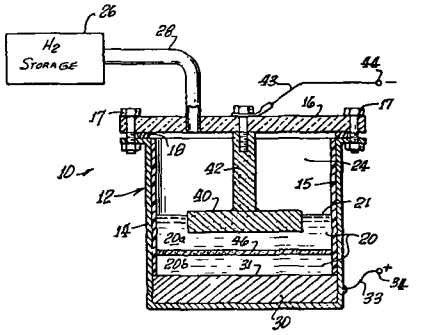
A pyrolysis system and process for recovering energy from solid waste and other feedstocks containing hydrocarbons such as coal, asphalt, naphtha, cheap crude oils, etc. is described. The process is comprised of the following steps: continuously feeding the feedstock into a pyrolyzer for pyrolysis and gasification; continuously circulating a hot heat transfer agent through the pyrolyzer for promoting pyrolysis and gasification by direct contact with the feedstock; and removing the pyrolysis gases from the pyrolyzer for further energy treatment and use. NASA



N76-18641* National Aeronautics and Space Administration. Pasadena Office, Calif.
HYDROGEN-BROMINE SECONDARY BATTERY Patent
Christopher England, inventor (to NASA) (JPL) Issued 15 Jul. 1975 5 p Filed 11 Jul. 1973 Sponsored by NASA
(NASA-Case-NPO-13237-1; US-Patent-3,894,887; US-Patent-Appl-SN-378127; US-Patent-Class-136-86S; US-Patent-Class-136-83R) Avail: US Patent Office CSCL 10C

A secondary battery is described utilizing hydrogen and halogen as primary reactants. It comprises inert anode and cathode initially contacting an aqueous solution of an acid and an alkali metal bromide. The hydrogen generated during charging of the cell is stored as gas, while the bromine becomes dissolved predominantly in the lower layers of the acid electrolyte. Preferred components are phosphoric acid and lithium bromide.

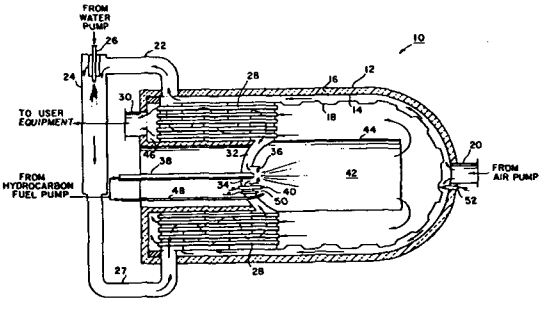
Official Gazette of the U.S. Patent Office



N76-18642* National Aeronautics and Space Administration. Pasadena Office, Calif.
HYDROGEN-RICH GAS GENERATOR Patent
John Houseman, inventor (to NASA) (JPL) Issued 18 Nov. 1975 11 p Filed 26 Feb. 1973 Sponsored by NASA
(NASA-Case-NPO-13464-1; US-Patent-3,920,416; US-Patent-Appl-SN-428444; US-Patent-Class-48-95; US-Patent-Class-23-281; US-Patent-Class-48-63; US-Patent-Class-48-75; US-Patent-Class-48-116; US-Patent-Class-48-117; US-Patent-Class-123-3; US-Patent-Class-423-650) Avail: US Patent Office CSCL 10B

A process and apparatus are described for producing a hydrogen rich gas from liquid hydrocarbon and water using the partial oxidation steam reforming process.

Official Gazette of the U.S. Patent Office

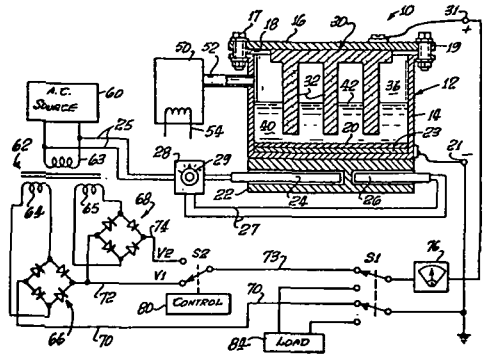


N76-18643* National Aeronautics and Space Administration. Pasadena Office, Calif.

ZINC-HALIDE BATTERY WITH MOLTEN ELECTROLYTE Patent

Christopher England, inventor (to NASA) (JPL) Issued 14 Oct. 1975 6 p Filed 11 Jul. 1973 Sponsored by NASA (NASA-Case-NPO-11961-1; US-Patent-3,912,999; US-Patent-Appl-SN-378126; US-Patent-Class-320-22; US-Patent-Class-136-6LF; US-Patent-Class-136-30; US-Patent-Class-320-21) Avail: US Patent Office CSCL 10C

An electrochemical cell is described which uses zinc and either chlorine or bromine as the primary reactants, with a molten, nonaqueous zinc halide electrolyte. During charging of the cell, growth of dendrites on the zinc electrode is controlled by operating the cell continuously or intermittently at a temperature above the melting point of zinc, thereby positively preventing such growth; or by operating at such temperature that incipient dendrites are melted by heat generated by the charging current. That current may be intermittently increased to insure such dendrite control. In a large battery of cells utilizing chlorine as the halogen, excess halogen gas developed during charging of the battery is compressed and liquefied to facilitate external storage, and a large portion of the energy required for compression is recovered upon expansion of the gas during battery discharge. Official Gazette of the U.S. Patent Office

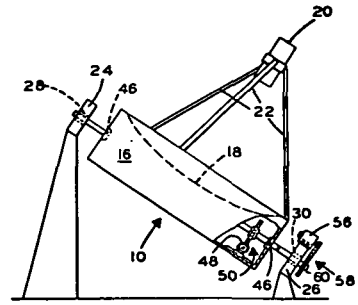


N76-18679*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A MOUNT FOR CONTINUOUSLY ORIENTING A COLLECTOR DISH IN A SYSTEM ADAPTED TO PERFORM BOTH DIURNAL AND SEASONAL SOLAR TRACKING Patent Application

Lott W. Brantley and Billy D. Lawson, inventors (to NASA) Filed 29 Jan. 1976 12 p (NASA-Case-MFS-23267-1; US-Patent-Appl-SN-653422) Avail: NTIS HC $3.50 CSCL 13I

The mount is characterized by a rigid, angulated axle having a linear midportion supporting a collector dish, and oppositely extended end portions normally related to the midportion of the axle and received in spaced journals. The longitudinal axis of symmetry for the midportion of the axle is coincident with a a diurnal axis paralleling the earth's polar axis. Drive means are provided for periodically displacing the axle about the diurnal axis at a substantially constant rate, while other drive means are provided for periodically indexing the dish through 1 deg about the seasonal axis, once during each of the earth's successive rotations about its polar axis. The position of the dish relative to the axle is thus varied for accommodating seasonal tracking as changes in the angle of inclination of the polar axis occur. NASA

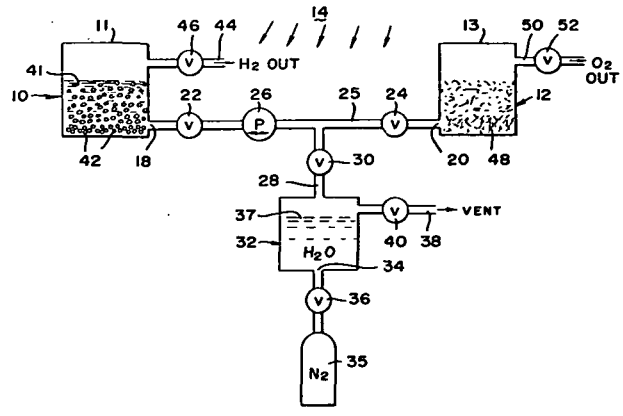


N76-18680*# National Aeronautics and Space Administration. Pasadena Office, Calif.

SOLAR PHOTOLYSIS OF WATER Patent Application

Porter R. Ryason, inventor (to NASA) (JPL) Filed 13 Feb. 1976 14 p (Contract NAS7-100) (NASA-Case-NPO-13675-1; US-Patent-Appl-SN-658132) Avail: NTIS HC $3.50 CSCL 21D

Hydrogen is produced by the solar photolysis of water in a photooxidation vessel in the presence of a water soluble photooxidizable reagent and an insoluble hydrogen recombination catalyst. Simultaneously oxygen is produced in a photoreduction reactor in the presence of an insoluble photoreduction reagent catalyst. When spent, the solution from the first reactor is fed into the second reactor. A reaction occurs in the dark in which the redox reagents are regenerated, and the regenerated photooxidation reagent solution is recycled to the first reactor. The photooxidation reagent is preferably a europium salt, and the associated hydrogen recombination catalyst is a material such as platinum supported on glass beads. The photoreduction catalyst is a bifunctional reagent catalyst including a transition metal salt such as manganese oxychloride covalently bonded to the surface of a high area support such as glass fibers, together with a hydroxyl or chlorohydroxyl decomposition catalyst of high area. NASA



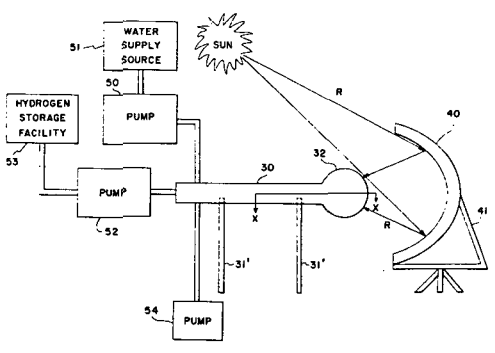
N76-19552*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

FLEXIBLE FORMULATED PLASTIC SEPARATORS FOR ALKALINE BATTERIES Patent Application
D. W. Scheibley, J. M. Bozek, and D. G. Soltis, inventors (to NASA) Filed 8 Mar. 1976 10 p
(NASA-Case-LEW-12363-1; US-Patent-Appl-SN-665034) Avail: NTIS HC $3.50 CSCL 10C

A flexible separator for alkaline batteries is described which comprises a coating applied to a nonwoven porous substrate such as sheets or mats of asbestos or other materials which are inert with respect to the alkaline electrolyte of the battery. The coating material comprises a polyphenylene oxide polymer, an organic additive and inorganic and organic fillers which comprise 55% by volume or less of the coating material. Preferably, at least one inorganic filler material which is reactive with the electrolyte is included to produce desirable pores in the coating. The organic additive is a polymeric polyester material which is hydrolyzed by the alkaline electrolyte to improve conductivity of the coating. NASA

N76-19564*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
SOLAR HYDROGEN GENERATOR Patent Application
Daniel I. Sebacher and Alexander P. Sabol, inventors (to NASA) Filed 24 Mar. 1976 11 p
(NASA-Case-LAR-11361-1; US-Patent-Appl-SN-669928) Avail: NTIS HC $3.50 CSCL 10A

An apparatus is disclosed for using solar energy to decompose water molecules into hydrogen and oxygen molecules. Solar energy is concentrated on a globe containing water thereby heating the water to its dissociation temperature. The globe is pervious to hydrogen molecules permitting them to pass through the globe while being essentially impervious to oxygen molecules. The hydrogen molecules are collected after passing through the globe and the oxygen molecules are removed from the globe. NASA

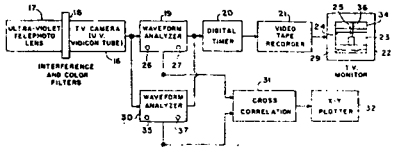


45 ENVIRONMENT POLLUTION

Includes air, noise, thermal and water pollution; environment monitoring; and contamination control.

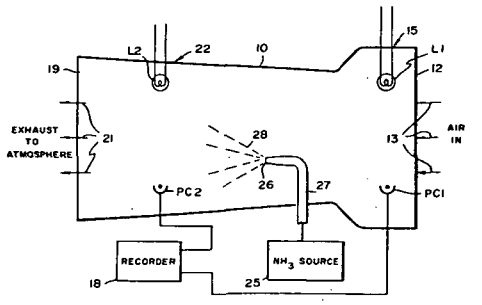
N76-17656* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
STACK PLUME VISUALIZATION SYSTEM Patent
Reginald J. Exton, inventor (to NASA) Issued 6 Jan. 1976 6 p Filed 11 Mar. 1975 Supersedes N75-20091 (13 - 11, p 1308)
(NASA-Case-LAR-11675-1; US-Patent-3,931,462; US-Patent-Appl-SN-557448; US-Patent-Class-178-6.8; US-Patent-Class-178-DIG.1; US-Patent-Class-178-DIG.8; US-Patent-Class-250-373; US-Patent-Class-340-237S; US-Patent-Class-356-207) Avail: US Patent Office CSCL 13B

A method and apparatus for measuring, at a remote location, the concentration and velocity of SO2 in plume from a smokestack are described. An ultraviolet video system views the plume against the background sky at wavelengths where SO2 molecules absorb light. The result is a real time display of the plume coupled with means for measuring the SO2 concentration at any point in the plume and at any time desired. In addition, means are provided in combination with the ultraviolet video system for measuring the velocity of the SO2 in the plume.
Official Gazette of the U.S. Patent Office



N76-21742* National Aeronautics and Space Administration. Pasadena Office, Calif.
INDICATOR PROVIDING CONTINUOUS INDICATION OF THE PRESENCE OF A SPECIFIC POLLUTANT IN AIR Patent
Charles G. Miller (JPL) and Ralph E. Bartera, inventors (to NASA) (JPL) Issued 23 Mar. 1976 5 p Filed 7 Nov. 1974 Supersedes N75-11308 (13 - 02, p 0171) Sponsored by NASA
(NASA-Case-NPO-13474-1; US-Patent-3,945,801; US-Patent-Appl-SN-521817; US-Patent-Class-23-254E; US-Patent-Class-356-37; US-Patent-Class-250-574) Avail: US Patent Office CSCL 13B

A continuous HCl in-air indicator was developed which consists of a tube-like element with an inlet end through which a continuous stream of air containing HCl enters. The air flows downstream from the inlet end and exits the element's outlet end. Positioned between the element's inlet and outlet ends are first and second spaced apart photoelectric units, which are preferably positioned adjacent the inlet and outlet ends, respectively. Ammonia gas is injected into the air, flowing through the element, at a position between the two photoelectric units. The ammonia gas reacts with the HCl in the air to form ammonium chloride particles. The difference between the outputs of the two photoelectric units is an indication of the amount of HCl in the air stream. Official Gazette of the U.S. Patent Office

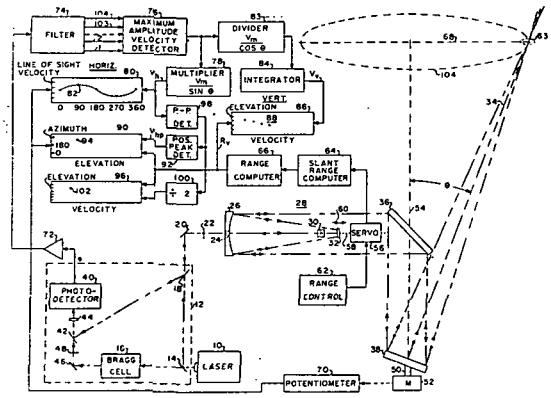


47 METEOROLOGY AND CLIMATOLOGY

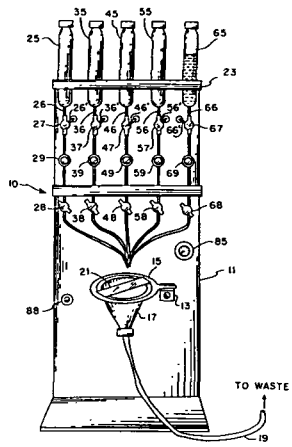
Includes weather forecasting and modification.

N76-13701*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
WIND MEASUREMENT SYSTEM Patent Application
William C. Cliff, Werner K. Dahm, Robert M. Huffaker, Michael C. Krause (LMSC, Huntsville, Ala.), Thomas R. Lawrence (LMSC, Huntsville, Ala.), James A. L. Thomson (Phys. Dyn., Inc., Berkeley, Calif.), and David J. Wilson, inventors (to NASA) (LMSC, Huntsville, (NASA-Case-MFS-23362-1; US-Patent-Appl-SN-637268) Avail: NTIS HC $3.50 CSCL 04B

A system for remotely measuring vertical and horizontal winds present in discrete volumes of air at selected locations above the ground is described. A laser beam is optically focused in range by a telescope, and the output beam is conically scanned at an angle theta about a vertical axis. The backscatter, or reflected light, from the ambient particulates in a volume of air, the focal volume, is detected for shifts in wavelength, and from these, horizontal and vertical wind components are computed. NASA



ically and sequentially flooding the slide with increments of a primary stain, a mordant, a decolorizer, a counterstain and a wash solution in a sequential manner. NASA



52 AEROSPACE MEDICINE

Includes physiological factors, biological effects of radiation; and weightlessness.

51 LIFE SCIENCES (GENERAL)

Includes genetics.

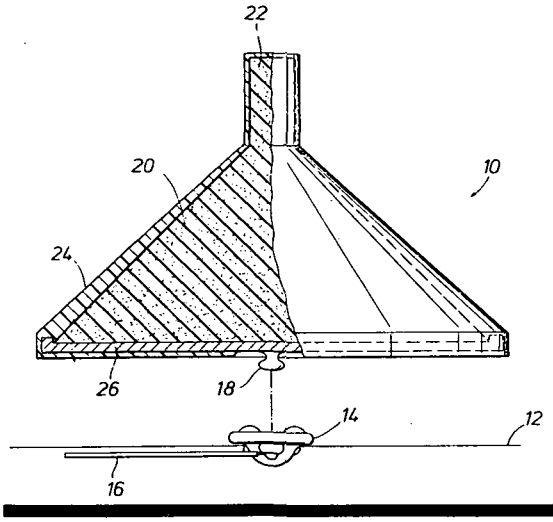
N76-13725*# National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
AUTOMATED SINGLE-SLIDE STAINING DEVICE Patent Application
Judd R. Wilkins and Stacey M. Mills, inventors (to NASA) Filed 29 Oct. 1975 18 p
(NASA-Case-LAR-11649-1; US-Patent-Appl-SN-626942) Avail: NTIS HC $3.50 CSCL 06M

A simple apparatus and method is disclosed for making individual single Gram stains on bacteria inoculated slides to assist in classifying bacteria in the laboratory as Gram-positive or Gram-negative. The apparatus involves positioning a single inoculated slide in a stationary position and thereafter automat-

N76-13735*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
SNAP-IN COMPRESSIBLE BIOMEDICAL ELECTRODE Patent Application
James D. Frost, Jr. (Methodist Hospital) and Carl E. Hillman, Jr., inventors (to NASA) (Methodist Hospital) Filed 8 Dec. 1975 10 p
(Contract NAS9-12460)
(NASA-Case-MSC-14623-1; US-Patent-Appl-SN-637269) Avail: NTIS HC $3.50 CSCL 06B

A replaceable, prefilled electrode enclosed in a plastic seal and suitably adapted for attachment to a reusable, washable cap having snaps is described. The apparatus is particularly adapted for quick positioning of electrodes to obtain an EEG. The individual electrodes are formed of a sponge body which is filled with a conductive electrolyte gel during manufacture. The sponge body is adjacent to a base formed of a conductive plastic material. The base has at its center a male gripper snap. The cap locates the female snap to enable the electrode to be positioned. The electrode can be stored and used quickly by attaching to the female gripper snap. The snap is correctly positioned and located by mounting it in a stretchable cap. The cap is reusable with new electrodes for each use. The electrolyte

gel serves as the contact electrode to achieve a good ohmic contact with the scalp. NASA

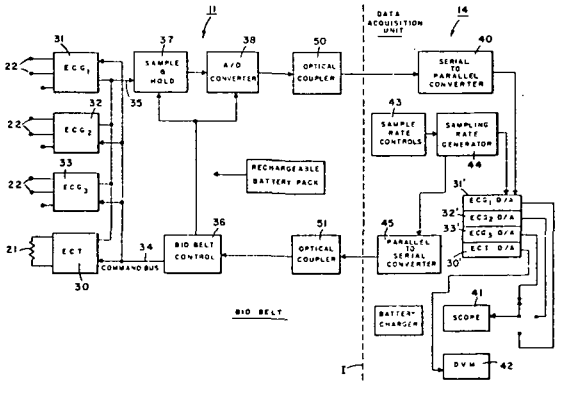


N76-14757* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

MEDICAL SUBJECT MONITORING SYSTEMS Patent

Garry J. Cleveland (LMSC, Sunnyvale, Calif.), George M. Loh (LMSC, Sunnyvale, Calif), Robert S. Lunce (LMSC, Sunnyvale, Calif.), Norman Belasco, Marko I. Lipanovich (LMSC, Sunnyvale, Calif.), Howard E. Peterssen (LMSC, Sunnyvale, Calif.), Sam L. Pool, and Donald W. Mangold, inventors (to NASA) (Boeing Co., Pasadena, Tex.) Issued 7 Oct. 1975 12 p Field 25 Apr. 1973 Supersedes N73-22045 (11 - 13, p 1486)
(NASA-Case-MSC-14180-1; US-Patent-3,910,257;
US-Patent-Appl-SN-354406; US-Patent-Class-128-2.1A;
US-Patent-Class-128-2H; US-Patent-Class-128-2.06R) Avail: US Patent Office CSCL 06B

Medical monitoring systems allowing the monitored subject freedom of movement are described. The outputs of the sensors are suitably amplified and conditioned to provide the necessary voltage levels for the multiplexers in the analog-to-digital (A/D) converters. The measured phenomena are displayed at a remote monitoring and control station. The entire system includes a bio-belt linked by optically coupled transmission and reception links to a data acquisition unit (DUA) having a central station function of controlling and displaying the output from the bio-belt. Official Gazette of the U.S. Patent Office

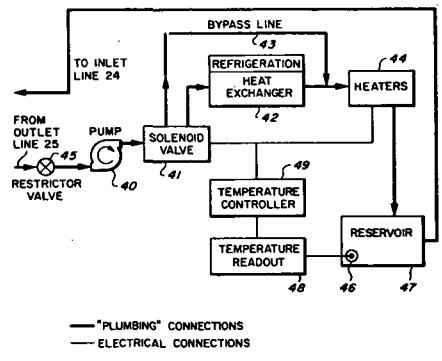


N76-18782*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

LIQUID-COOLED BRASSIERE Patent Application

William Elkins (Acurex Corp.), Bill Alvin Williams, and Ernest Glenn Tickner, inventors (to NASA) (Acurex Corp.) Filed 27 Jan. 1976 18 p
(NASA-Case-ARC-11007-1; US-Patent-Appl-SN-652948) Avail: NTIS HC $3.50 CSCL 06B

A device is described for enhancing the detection of malignant tissue in the breasts of a woman. It is comprised of a brassiere-like garment which is fitted with a pair of liquid-perfused cooling panels which completely and compliantly cover the breasts and upper torso. The garment is connected by plastic tubing to a liquid cooling system composed of a fluid pump, a solenoid control valve for controlling the flow of fluid to either the cooling unit or the heating unit, a fluid reservoir, a temperature sensor in the reservoir, and a restrictor valve to control the pressure in the garment inlet cooling line. NASA

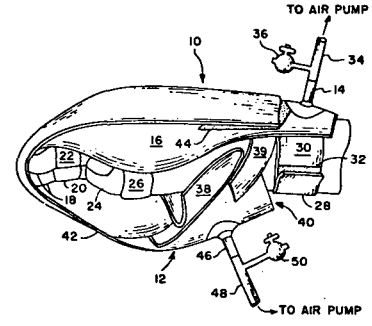


N76-19785* National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

THERAPEUTIC HAND EXERCISER Patent

Donald E. Barthlome, inventor (to NASA) Issued 10 Feb. 1976 7 p Filed 3 Jun. 1975 Supersedes N75-25539 (13 - 16, p 2013)
(NASA-Case-LAR-11667-1; US-Patent-3,937,215;
US-Patent-Appl-SN-583487; US-Patent-Class-128-26;
US-Patent-Class-128-DIG.20) Avail: US Patent Office CSCL 06B

A cyclic therapeutic hand exerciser based on inflation and deflation of structural members is described. A straightening and a bending motion is imparted to the fingers as air pressure inflates a splint-like upper member. The fingers are then straightened and upon deflation of the splint-like member and inflation of a wrist pouch a flap is tightened pulling the fingertips down and curling the fingers in toward the palm.
Official Gazette of the U.S. Patent Office

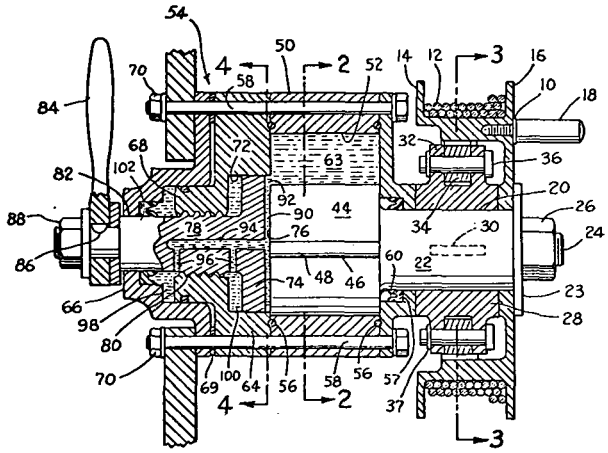


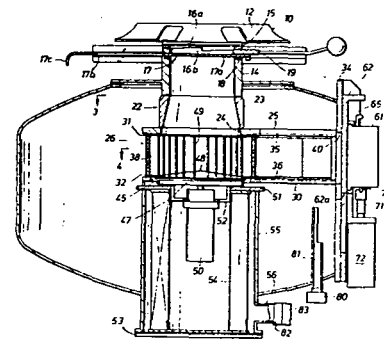
54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

N76-13770*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
EMERGENCY DESCENT DEVICE Patent Application
Robert R. Belew, inventor (to NASA) Filed 16 Oct. 1975 17 p
(NASA-Case-MFS-23074-1; US-Patent-Appl-SN-623188) Avail: NTIS HC $3.50 CSCL 06K

A descent device is provided for emergency descent from tall structures and for lowering objects from high elevations such as a hovering helicopter. The device includes a rotating spool having a cable wound thereon for descent and a rotation-retarding vane member which rotates in a fluid cylinder. An adjustable bypass is provided for the fluid as the vane member rotates therein so that the speed of descent can be adjustably controlled. NASA



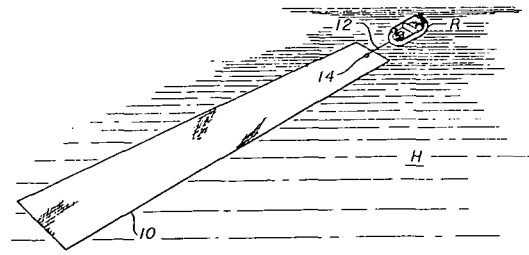


N76-14804* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
AUTOMATIC BIOWASTE SAMPLING Patent
G. L. Fogal (GE, Philadelphia) and Richard L. Sauer, inventors (to NASA) (GE, Philadelphia) Issued 28 Oct. 1975 8 p Filed 22 Nov. 1974 Supersedes N75-13536 (13 - 04, p 0458) Sponsored by NASA
(NASA-Case-MSC-14640-1; US-Patent-3,915,012; US-Patent-Appl-SN-526449; US-Patent-Class-73-421R; US-Patent-Class-128-2F) Avail: US Patent Office CSCL 06B

A solids biowaste sampling system for use under space flight conditions is described. The sampling system is comprised of: a storage container; a seat; and a tissue bypass which permits passage of a waste sample to a slinger assembly or delivery of tissue directly into the interior of the storage container. The slinger assembly has a rotating platform which radially distributes the biowaste materials transverse to the vertical in a shredded form. The biowaste material is collected by a sampling strip for retention and examination.
Official Gazette of the U.S. Patent Office

N76-15792*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
HIGH VISIBILITY AIR SEA RESCUE PANEL Patent Application
Jack Naimer and Mathew I. Radnofsky, inventors (to NASA) Filed 17 Dec. 1975 10 p
(NASA-Case-MSC-12564-1; US-Patent-Appl-SN-641862) Avail: NTIS HC $3.50 CSCL 05H

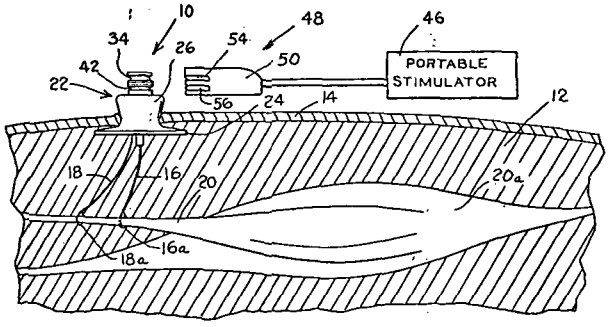
A system for air sea rescue utilizing a thin film, large area, easily deployable, highly visible, buoyant panel which is formed of a substrate having a specific gravity less than sea water and impregnated with a brilliant fluorescent pigment is described. The panel may be accordion folded for compactness and ease of deployment, may have an inflatable periphery to enhance deployment, rigidity, and buoyancy and may include means for attachment to a flotation device. NASA



N76-19816*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
PERCUTANEOUS CONNECTOR DEVICE Patent Application

Walter E. Parsons, inventor (to NASA) Filed 16 Sep. 1975 17 p
(NASA-Case-KSC-10849-1; US-Patent-Appl-SN-613734) Avail: NTIS HC $3.50 CSCL 06B

A percutaneous connector device for facilitating the passage of electrical signals from an external source through the skin of a patient to internal portions of the body such as muscles and nerves is described. The connector device includes a bio-compatible shell having an enlarged disk shaped portion for being implanted below the skin of the patient. The shell has a first and second electrically conductive post upon which a plug means can be readily connected and disconnected. A modified form of the invention utilizes a unipolar connector that is adapted to be plugged into a shell implanted below the skin of a patient. Both of the connector devices are designed so as to be separated when a predetermined force is applied to the implanted bio-compatible shell. NASA



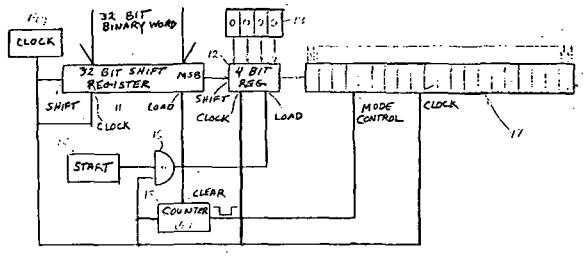
60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

For components see *33 Electronics and Electrical Engineering*.

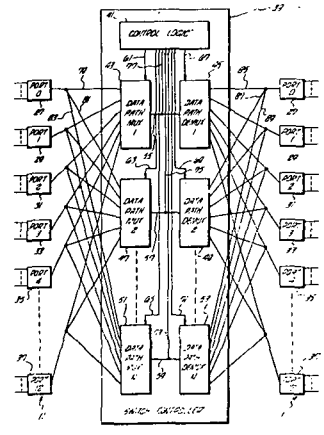
N76-13781*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
BINARY TO BINARY CODED DECIMAL CONVERTER Patent Application
Anthony J. Miller, inventor (to NASA) Filed 12 Nov. 1975 22 p
(NASA-Case-GSC-12044-1; US-Patent-Appl-SN-631341) Avail: NTIS HC $3.50 CSCL 09B

A converter is described in which a binary coded input signal is converted to a binary coded decimal signal having N decades by employing N four bit shift registers. The bits of the input signal are sequentially supplied, in order, to the least significant position of the register for the units decade, with the most significant bit of the input signal being applied to the units register first. Each of the registers includes a right shift-parallel load mode control input terminal. In response to the sum of the values stored in each register and the binary value 0011 being less than the binary value 1000, the mode control input terminal is activated to shift the register contents one bit to the right. In response to the sum being greater than 1000, the mode control input terminal is activated to load the sum into the register. A binary one is loaded into the least significant bit position of the register for the adjacent higher decade in response to the sum being greater than 1000. NASA



N76-14818* National Aeronautics and Space Administration. Pasadena Office, Calif.
MULTI-COMPUTER MULTIPLE DATA PATH HARDWARE EXCHANGE SYSTEM Patent
Tage O. Anderson, inventor (to NASA) (JPL) Issued 28 Oct. 1975 18 p Filed 6 Nov. 1974 Supersedes N75-12652 (13 - 03, p 0344) Sponsored by NASA
(NASA-Case-NPO-13422-1; US-Patent-3,916,380; US-Patent-Appl-SN-521601; US-Patent-Class-340-147R; US-Patent-Class-340-147C) Avail: US Patent Office CSCL 09B

A switch controller in a multi-computer processing system functions to establish a data path between any two computers in the system and maintain that data path, without interference, while establishing other independent unidirectional data paths with other pairs of computers. All computers in the system are continuously and rapidly scanned for a request-to-send signal. Those computers that are already engaged in data transmission are leap-frogged by the scanning mechanism. When a request-to-send signal is detected by a particular scanning mechanism, that scanning mechanism stops at the computer generating the request, to provide for an interconnection between the requesting sender and the intended receiver. If during this interconnection phase, it is determined that the intended receiver is occupied, the interconnection is prevented from being completed and the scanning mechanism is instructed to resume scanning of the computers for another request-to-send signal.
Official Gazette of the U.S. Patent Office

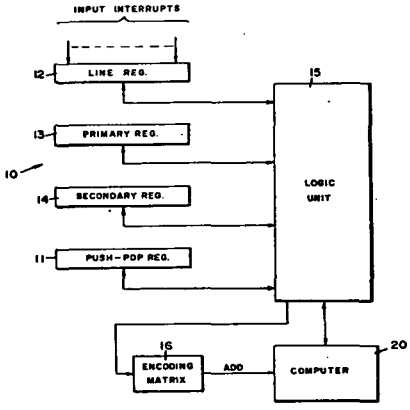


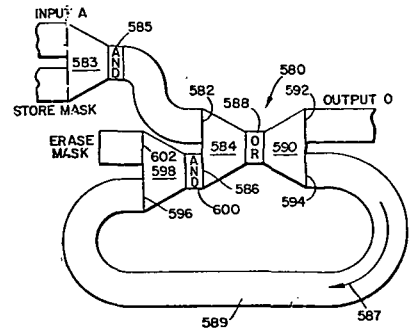
N76-18800* National Aeronautics and Space Administration. Pasadena Office, Calif.

PRIORITY INTERRUPT SYSTEM Patent
Harvey L. Jeane, inventor (to NASA) (JPL) Issued 13 Aug. 1974 11 p Filed 24 Jul. 1972 Sponsored by NASA (NASA-Case-NPO-13067-1; US-Patent-3,829,839; US-Patent-Appl-SN-274348; US-Patent-Class-340-172.5) Avail: US Patent Office CSCL 09B

A priority interrupt system is described. In the system, designed to accommodate up to n interrupts of different priority levels, each of the registers is of n bits, with the orders of the bits in the registers corresponding to the priority levels of the different interrupts. The highest order set bit in the push pop register indicates the priority level of the interrupt for which a subroutine is executed. Any lower order set bit indicates in priority level of an interrupt for which a subroutine was previously started and interrupted to service a subsequently received interrupt of a higher priority level. The subroutines are structured so that when a subroutine is completed the highest order set bit in the push pop register is reset and the controlled computer automatically returns to complete the subroutine associated with the next highest order set bit in the push pop register.

Official Gazette of the U.S. Patent Office



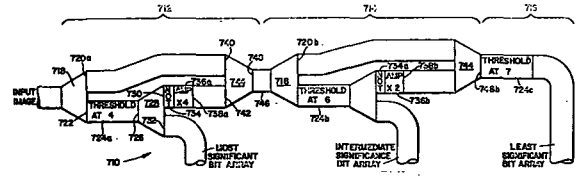


N76-18803*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS AND COMPUTING DEVICES Patent Application
David H. Schaeffer and James P. Strong, III, inventors (to NASA) Filed 13 Feb. 1976 78 p
(NASA-Case-GSC-11839-2; US-Patent-Appl-SN-657996) Avail: NTIS HC $5.00 CSCL 09B

Two-dimensional digital computers and computer devices are operated in parallel on rectangular arrays of digital radiant energy optical signal elements which are arranged in ordered rows and columns. Logic gate devices receive two input arrays and provide an output array having digital states dependent only on the digital states of the signal elements of the two input arrays at corresponding row and column positions. The logic devices include and array of photoconductors responsive to at least one of the input arrays for either selectively accelerating electrons to a phosphor output surface, applying potentials to an electroluminescent output layer, exciting an array of discrete radiant energy sources, or exciting a liquid crystal to influence crystal transparency or reflectivity. NASA

N76-18804*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS AND COMPUTING DEVICES Patent Application
David H. Schaeffer and James P. Strong, III, inventors (to NASA) Filed 13 Feb. 1976 65 p
(NASA-Case-GSC-11839-3; US-Patent-Appl-SN-657997) Avail: NTIS HC $4.50 CSCL 09B

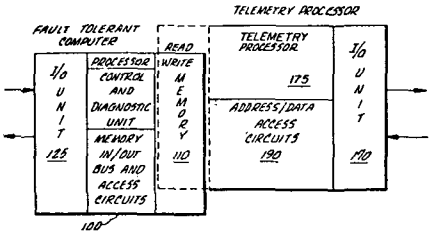
An analog to digital converter is described for two dimensional radiant energy array computers. The converter stage derives (1) a bit array of digital radiant energy signals representative of the amplitudes of an input radiant energy analog signal and (2) an output radiant analog signal array to serve as an input to succeeding stages. A digital radiant energy array device is used which contains radiant energy array positions so that the analog array is less than a predetermined threshold level. A scaling device which amplifiers the radiant energy signal levels of the input array is included. The digital array corresponds to the analog threshold level. An adder device adds the signals of the scaled input and digital arrays at corresponding array positions to form the output analog array. NASA

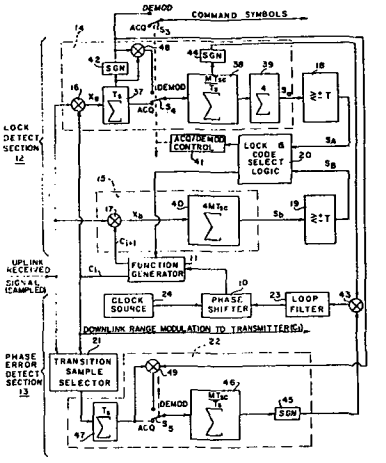


N76-21914* National Aeronautics and Space Administration. Pasadena Office, Calif.
SHARED MEMORY FOR A FAULT-TOLERANT COMPUTER Patent
George C. Gilley, inventor (to NASA) (JPL) Issued 13 Apr. 1976 10 p Filed 31 Aug. 1973 Supersedes N74-17911 (12 - 09, p 1026) Sponsored by NASA
(NASA-Case-NPO-13139-1; US-Patent-3,950,729; US-Patent-Appl-SN-393524; US-Patent-Class-340-172.5; US-Patent-Class-235-153AE) Avail: US Patent Office CSCL 09B

A system is described for sharing a memory in a fault-tolerant computer. The memory is under the direct control and monitoring of error detecting and error diagnostic units in the fault-tolerant computer. This computer verifies that data to and from the memory is legally encoded and verifies that words read from the memory at a desired address are, in fact, actually delivered from that desired address. The means are provided for a second processor, which is independent of the direct control and monitoring of the error checking and diagnostic units of the fault-tolerant computer, and to share the memory of the fault-tolerant computer. Circuitry is included to verify that: (1) the processor has properly accessed a desired memory location in the memory; (2) a data word read-out from the memory is properly coded; and (3) no inactive memory was erroneously outputting data onto the shared memory bus.

Official Gazette of the U.S. Patent Office





66 SYSTEMS ANALYSIS

Includes mathematical modeling; network analysis; and operations research.

N76-19888* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

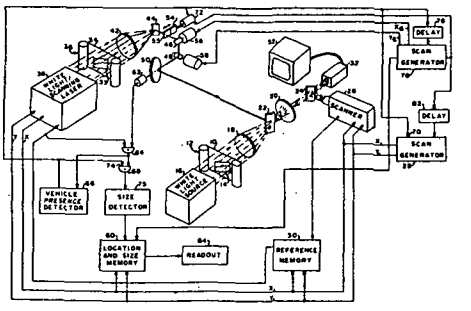
TRAFFIC SURVEY SYSTEM Patent

Joseph H. Kerr, inventor (to NASA) Issued 6 Jan. 1976 6 p Filed 11 Dec. 1974 Supersedes N75-13226 (13 - 04, p 0418)

(NASA-Case-MFS-22631-1; US-Patent-3,930,735; US-Patent-Appl-SN-531572; US-Patent-Class-356-167; US-Patent-Class-340-38P; US-Patent-Class-356-71; US-Patent-Class-356-162) Avail: US Patent Office CSCL 12B

A traffic survey system is described in which an aerial photo survey transparency is first made of a significant survey area, for example, two kilometers square. The transparency is then optically scanned to check the position and size of vehicles on roadways in the area. By computer control comparison with a reference transparency wherein areas other than roadways are made opaque and roadways are made clear, scanning may be directed solely to roadway regions. Vehicle size analysis is accomplished by means of discrete holographic filters corresponding to selected size vehicles.

Official Gazette of the U.S. Patent Office



61 COMPUTER PROGRAMMING AND SOFTWARE

Includes computer programs, routines, and algorithms.

N76-18826*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MULTIPLE RATE DIGITAL COMMAND DETECTION SYSTEM WITH RANGE CLEAN-UP CAPABILITY Patent Application

James R. Lesh (JPL) and Stanley A. Butman, inventors (to NASA) (JPL) Filed 17 Feb. 1976 31 p

(Contract NAS7-100)

(NASA-Case-NPO-13753-1; US-Patent-Appl-SN-658449) Avail: NTIS HC $3.50 CSCL 09B

A multirate digital command system is disclosed which uses the composite signal of a micron-type ranging system as a subcarrier to transmit range codes and data from a station to a receiver where the range codes are sequentially phase modulated. A range cleanup loop in a spacecraft locks the phase of a locally generated reference component C(i) to a received ranging component C(i) and retransmits the component to a ground station. When the inverse phase, of a ranging component is received and detected, the cleanup loop is modified to demodulate phase modulated command symbols while continuing tracking the same ranging component C(i). The command symbol rate is coherently related to the ranging signal component bit rate. NASA

71 ACOUSTICS

Includes sound generation, transmission and attenuation.

For noise pollution see *45 Environment Pollution*.

N76-18886*# National Aeronautics and Space Administration. Pasadena Office, Calif.

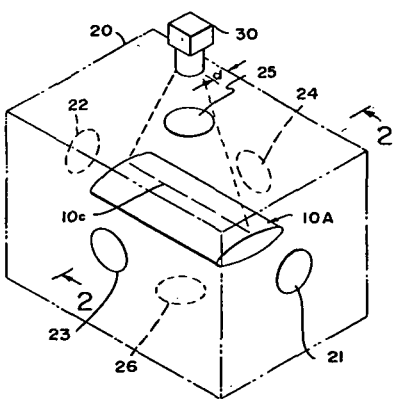
ACOUSTIC ENERGY SHAPING Patent Application

Taylor G. Wang (JPL) and Daniel D. Elleman, inventors (to NASA) (JPL) Filed 13 Feb. 1976 10 p

(Contract NAS7-100)

(NASA-Case-NPO-13802-1; US-Patent-Appl-SN-658133) Avail: NTIS HC $3.50 CSCL 20A

A suspended mass is shaped by melting all or a selected portion of the mass and applying acoustic energy in varying amounts to different portions of the mass. In one technique for forming an optical waveguide slug, a mass of oval section is *suspended and only a portion along the middle of the cross-section* is heated to a largely fluid consistency. Acoustic energy is applied to opposite edges of the oval mass to press the unheated opposite edge portions together so as to form bulges at the middle of the mass. In another technique for forming a ribbon of silicon for constructing solar cells, a cylindrical thread of silicon is drawn from a molten mass of silicon, and acoustic energy is applied to opposite sides of the molten thread to flatten it into a ribbon. NASA



72 ATOMIC AND MOLECULAR PHYSICS

Includes atomic structure and molecular spectra.

N76-15860* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

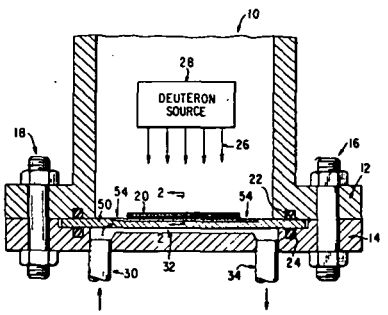
DEUTERIUM PASS THROUGH TARGET Patent

Donald L. Alger, inventor (to NASA) Issued 2 Dec. 1975 7 p Filed 27 Aug. 1974 Supersedes N74-32719 (12 - 22, p 2672)

(NASA-Case-LEW-11866-1; US-Patent-3,924,137; US-Patent-Appl-SN-500980; US-Patent-Class-250-499; US-Patent-Class-250-500) Avail: US Patent Office CSCL 20H

A neutron emitting target for use in neutron generating apparatus including a deuteron source and an accelerator vacuum chamber, comprised of a tritium-containing target layer, a deuteron accumulation layer, and a target support containing passages providing communication between the accumulation layer and portions of the surface of the support exposed to the accelerator vacuum chamber is described. With this arrangement, deuterons passing through the target layer and implanting in and diffusing through the accumulation layer, diffuse into the communicating passages and are returned to the accelerator vacuum chamber. Continuous removal of deuterons from the target in conventional water cooled neutron generating apparatus is provided. Preferably, the target is provided with thin barrier layers to prevent undesirable tritium diffusion out of the target layer, as well as deuteron *diffusion into the target layer.*

Official Gazette of the U.S. Patent Office



74 OPTICS

Includes light phenomena.

N76-13909*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

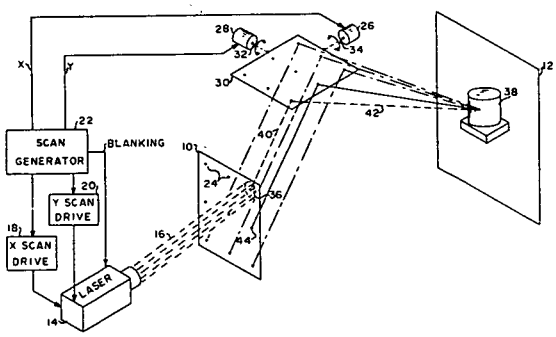
PROJECTION SYSTEM FOR DISPLAY OF PARALLAX AND PERSPECTIVE Patent Application

Robert L. Kurtz, inventor (to NASA) Filed 6 Nov. 1975 9 p

(NASA-Case-MFS-23194-1; US-Patent-Appl-SN-629458) Avail: NTIS HC $3.50 CSCL 20F

A projection system for the display of parallax and perspective of a three-dimensional image on a two-dimensional screen using holography was described. The system consists in projecting a *reference beam in a sequence of several projections at selected* angles of perspective through the hologram; the resulting images from the hologram are directed onto a mirror which is coordinately

tilted to reflect them onto a screen where they appear as a single three-dimensional image. Author

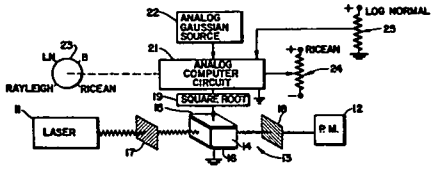


N76-18913* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

APPARATUS FOR SIMULATING OPTICAL TRANSMISSION LINKS Patent

Michael W. Fitzmaurice and Mona Tycz, inventors (to NASA) Issued 10 Feb. 1976 7 p Filed 25 Jun. 1974 Supersedes N74-30532 (12 - 20, p 2385)
(NASA-Case-GSC-11877-1; US-Patent-3,937,945; US-Patent-Appl-SN-482953; US-Patent-Class-235-184; US-Patent-Class-250-199) Avail: US Patent Office CSCL 20F

A space-to-space or space-to-earth optical transmission link is simulated by positioning a linear optical modulator between an optical carrier source and a receiver for the carrier. The optical modulator is driven by an analog signal having random variations indicative of characteristics of the transmission link, as derived from an analog computer circuit. The analog computer circuit is responsive to a Gaussian random analog source. For space-to-space transmission, transmitter pointing jitter is a dominant noise source and is simulated by deriving a beta statistical variation from the analog computer. For space-to-earth transmission, atmospheric scintillation is a dominant noise source and is simulated by driving the modulator with one of (1) a log normal, (2) Rayleigh, or (3) Ricean output of the analog computer circuit. Official Gazette of the U.S. Patent Office

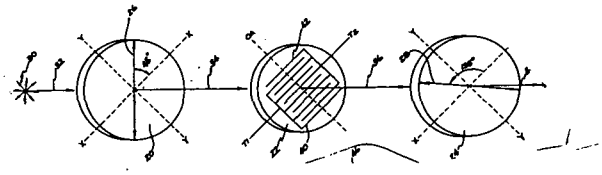


N76-18917*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

OPTICAL CONVERSION METHOD Patent Application

William E. Perry, inventor (to NASA) Filed 21 Jan. 1976 15 p
(NASA-Case-MSC-12618-1; US-Patent-Appl-SN-651007) Avail: NTIS HC $3.50 CSCL 20F

A method for converting an optical system is described which employs an electrooptic device in conjunction with a pair of crossed polarizing devices between an activated mode and a deactivated mode. The optical system may be used as a neutral density filter, a selective color filter, or a light shutter, as applied to a television camera. The electrooptic device and the polarizing analyzer are fixed with respect to the television camera, and the first polarizing device is selectively positioned in, or removed from, the optical path of the optical system to activate or deactivate it. Where the optical system is used as a selective color filter to produce light beams of alternating colors in a field sequential color television system, deactivation of the optical system renders the television a black-and-white system. NASA

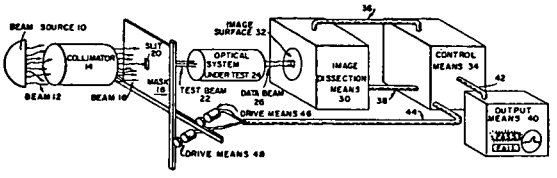


N76-19935* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

ELECTRONIC OPTICAL TRANSFER FUNCTION ANALYZER Patent

Edwin E. Klingman, III, inventor (to NASA) Issued 17 Feb. 1976 6 p Filed 24 Apr. 1973 Supersedes N73-22630 (11 - 13, p 1558)
(NASA-Case-MFS-21672-1; US-Patent-3,938,892; US-Patent-Appl-SN-354060; US-Patent-Class-356-124; US-Patent-Class-356-123) Avail: US Patent Office CSCL 20F

An image dissector tube is reported whose positioning coils serve as an image element addressing means. The system is useable with any optical system including visible light, other electromagnetic radiation or charged particles (ion or electrons) so long as the image dissection means is responsive to the beam in question. The optical system under test produces a real image at the image dissection surface of the image dissection means in order for readily evaluatable data to be obtained. The entire system is preferably computer controlled in order to obtain the necessary data quickly and accurately and to calculate the optical transfer function of the optical system under test on line. With this system both the modulation transfer function and the phase transfer function may be calculated. The digital computer can control the analyzer in any of several modes.
Official Gazette of the U.S. Patent Office



N76-20958* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

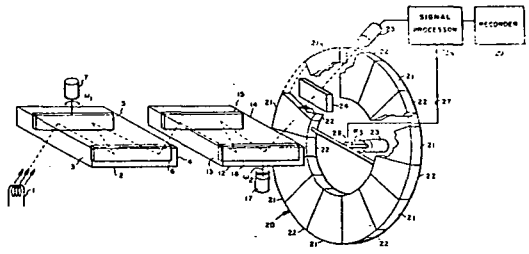
METHOD AND APPARATUS FOR COMPENSATING REFLECTION LOSSES IN A PATH LENGTH MODULATED ABSORPTION-ABSORPTION TRACE GAS DETECTOR Patent

John Dimeff, inventor (to NASA) Issued 9 Mar. 1976 6 p Filed 15 Oct. 1974 Supersedes N74-34864 (12 - 24, p 2948)

(NASA-Case-ARC-10631-1; US-Patent-3,943,368; US-Patent-Appl-SN-514546; US-Patent-Class-250-573; US-Patent-Class-250-343) Avail: US Patent Office CSCL 20F

A method and apparatus is described for determining the density of a reference gas in an unknown gas. The apparatus is comprised of (1) a chamber for containing a gas including a reference gas at a known partial density, (2) a chamber for containing a gas including a sample of the reference gas at an unknown partial density, (3) a source of radiant energy and, (4) a chopper wheel comprised of gas cells containing a sample of the reference gas and gas cells containing a gas excluding the reference gas. The path length of the radiant energy in the chambers in modulated and the radiant energy and the position of the chopper cells with respect to the radiant energy path are sensed providing a signal proportional to the density of the reference gas in the unknown gas sample.

Official Gazette of the U.S. Patent Office



N76-20959*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

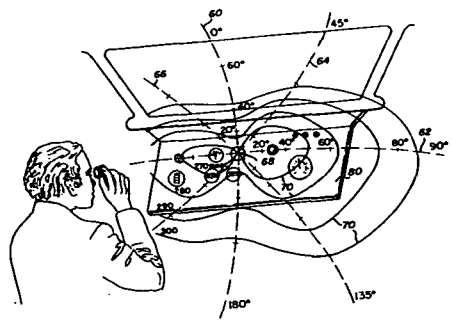
OPTICAL INSTRUMENT EMPLOYING RETICLE HAVING PRESELECTED VISUAL RESPONSE PATTERN FORMED THEREON *Patent Application*

Richard F. Haines, inventor (to NASA) Filed 8 Mar. 1976 19 p

(NASA-Case-ARC-10976-1; US-Patent-Appl-SN-665032) Avail: NTIS HC $3.50 CSCL 20F

A hand held optical instrument for use in locating indicator lights for the like on a work surface is described. The device provides a reflective reticle including a reference pattern and a plurarity of contours each representative of a given iso-response time for an average viewer to respond to a light of a preselected color.

NASA



75 PLASMA PHYSICS

Includes magnetohydrodynamics and plasma fusion. For ionospheric plasmas see *46 Geophysics*. For space plasmas see *90 Astrophysics*.

N76-14931* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

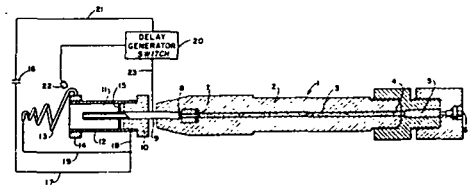
TWO STAGE LIGHT GAS-PLASMA PROJECTILE ACCELERATOR Patent

Edward L. Shriver, David W. Jex, inventors (to NASA), and Edward B. Igenbergs (NAS-NRC) Issued 4 Nov. 1975 10 p Filed 29 Jan. 1974 Supersedes N74-18891 (11 - 10, p 1148)

(NASA-Case-MFS-22287-1; US-Patent-3,916,761; US-Patent-Appl-SN-438-147; US-Patent-Class-89-8; US-Patent-Class-73-12; US-Patent-Class-315-111.6) Avail: US Patent Office CSCL 20I

A device for accelerating a projectile to extremely high velocities is described. The device includes a light gas-accelerator to impart an initial high velocity to the projectile and a plasma accelerator and compressor receiving the moving projectile and accelerating it to higher velocities. A capacitor bank is discharged into a plasma generator in timed relationship to the position of the projectile so that the moving plasma drags the projectile along with it. Projectile velocities in the order of 20 kilometers per second, the average meteoroid velocity, can be attained. The accelerator finds particular utility in the field of meteoroid simulation.

Official Gazette of the U.S. Patent Office



N76-17951* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

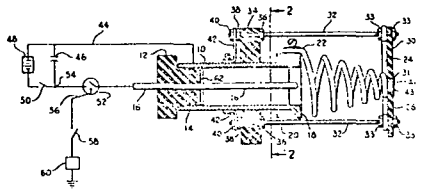
SELF-ENERGIZED PLASMA COMPRESSOR Patent

Edward L. Shriver (NAS-NRC) and Eduard B. Igenbergs, inventors (to NASA) (NAS-NRC) Issued 30 Dec. 1975 4 p Filed 27 Aug. 1974 Supersedes N74-35145 (12 - 24, p 2983) Division of US Patent Appl. SN-367606, filed 6 Jun. 1973, US-Patent-3,854,097 Sponsored by NASA

(NASA-Case-MFS-22145-2; US-Patent-3,929,119; US-Patent-Appl-SN-500982; US-Patent-Class-124-1; US-Patent-Class-89-8; US-Patent-Class-124-11R; US-Patent-Appl-SN-367606; US-Patent-3,854,097) Avail: US Patent Office CSCL 20I

A self-energized plasma compressor which compresses plasma discharged from a coaxial plasma generator is described. The device includes a helically shaped coil which is coaxially aligned with the center axis of the coaxial plasma generator. The plasma generator creates a current through the helical coil which, in turn, generates a time varying magnetic field that creates a force which acts radially upon the plasma. The coaxial plasma generator and helical coil move the plasma under high pressure and temperature to the narrow end of the coil. Positioned adjacent

the narrow end of the coil are beads which are engaged by the plasma to be accelerated to hypervelocities for simulating meteoroids. Official Gazette of the U.S. Patent Office



76 SOLID-STATE PHYSICS

Includes superconductivity.

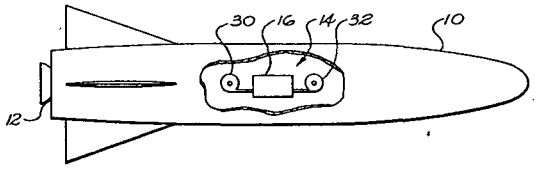
For related information, see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

N76-13934*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

A METHOD AND APPARATUS FOR CONTINUOUSLY PROCESSING A SINGLE CRYSTALLINE RIBBON IN A REDUCED GRAVITY ENVIRONMENT **Patent Application**

Hans U. Walter, inventor (to NASA) (Ala. Univ., Huntsville) Filed 10 Nov. 1975 14 p Sponsored by NASA (NASA-Case-MFS-23002-1; US-Patent-Appl-SN-630584) Avail: NTIS HC $3.50 CSCL 20B

A method and apparatus is described for continuously producing an uncontaminated single crystalline sheet of material of a controlled thickness having substantially optically flat surfaces. The method is performed in a reduced gravitational environment, such as outer space. A polycrystalline sheet of material is fed through a chamber with a heating element which progressively melts a transverse strip of the material as it is moved through the chamber. A single crystalline seed is positioned closely adjacent the molten zone for transforming the polycrystalline material into a single crystalline foil. The heating element has curved ends and terminates short of the opposed edges of the polycrystalline sheet. NASA



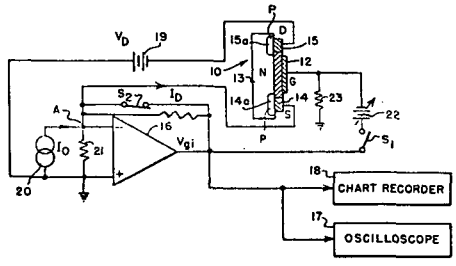
N76-20994* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD AND APPARATUS FOR MEASUREMENT OF TRAP DENSITY AND ENERGY DISTRIBUTION IN DIELECTRIC FILMS **Patent**

Joseph Maserjian, inventor (to NASA) (JPL) Issued 9 Mar. 1976 8 p Filed 11 Nov. 1974 Supersedes N75-11307 (13 - 02, p 0171) Sponsored by NASA (NASA-Case-NPO-13443-1; US-Patent-3,943,442; US-Patent-Appl-SN-522551; US-Patent-Class-324-158R; US-Patent-Class-324-60C; US-Patent-Class-324-158D; US-Patent-Class-324-158T) Avail: US Patent Office CSCL 20L

Trap densities in dielectric films are determined by tunnel injection measurements when the film is incorporated in an insulated-gate field effect transistor. Under applied bias to the transistor gate, carriers (electrons or holes) tunnel into traps in the dielectric film. The resulting space charge tends to change channel conductance. By feeding back a signal from the source contact to the gate electrode, channel conductance is held constant, and by recording the gate voltage as a function of time, trap density can be determined as a function of distance from the dielectric-semiconductor interface. The process is repeated with the gate bias voltage at different levels in order to determine the energy distribution of traps as a function of distance from the interface.

Official Gazette of the U.S. Patent Office



1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA SP-7039 (09)		

4. Title and Subtitle	5. Report Date
NASA PATENT ABSTRACTS BIBLIOGRAPHY A Continuing Bibliography	July 1976
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
	10. Work Unit No.
9. Performing Organization Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	11. Contract or Grant No.
	13. Type of Report and Period Covered
12. Sponsoring Agency Name and Address	14. Sponsoring Agency Code

15. Supplementary Notes

Section 1 - Abstracts

16. Abstract

This bibliography is issued in two sections: Section 1 - Abstracts, and Section 2 - Indexes. This issue of the Abstract Section cites 200 patents and applications for patent introduced into the NASA scientific and technical information system during the period of January 1976 through June 1976. Each entry in the Abstract Section consists of a citation, an abstract, and in most cases, a key illustration selected from the patent or application for patent. This issue of the Index Section contains entries for 2994 patent and application for patent citations covering the period May 1969 through June 1976. The Index Section contains five indexes -- subject, inventor, source, number and accession number.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Bibliographies Inventions NASA Programs Patents	Unclassified - Unlimited

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	80	$3.00 HC

*For sale by the National Technical Information Service, Springfield, Virginia 22161

PUBLIC COLLECTIONS OF NASA DOCUMENTS

DOMESTIC

NASA distributes its technical documents and bibliographic tools to ten special libraries located in the organizations listed below. Each library is prepared to furnish the public such services as reference assistance, interlibrary loans, photocopy service, and assistance in obtaining copies of NASA documents for retention.

CALIFORNIA
University of California, Berkeley
COLORADO
University of Colorado, Boulder
DISTRICT OF COLUMBIA
Library of Congress
GEORGIA
Georgia Institute of Technology, Atlanta
ILLINOIS
The John Crerar Library, Chicago
MASSACHUSETTS
Massachusetts Institute of Technology, Cambridge
MISSOURI
Linda Hall Library, Kansas City
NEW YORK
Columbia University, New York
PENNSYLVANIA
Carnegie Library of Pittsburgh
WASHINGTON
University of Washington, Seattle

NASA publications (those indicated by an "*" following the accession number) are also received by the following public and free libraries:

CALIFORNIA
Los Angeles Public Library
San Diego Public Library
COLORADO
Denver Public Library
CONNECTICUT
Hartford Public Library
MARYLAND
Enoch Pratt Free Library, Baltimore
MASSACHUSETTS
Boston Public Library
MICHIGAN
Detroit Public Library
MINNESOTA
Minneapolis Public Library
MISSOURI
Kansas City Public Library
St. Louis Public Library
NEW JERSEY
Trenton Public Library
NEW YORK
Brooklyn Public Library
Buffalo and Erie County Public Library
Rochester Public Library
New York Public Library
OHIO
Akron Public Library
Cincinnati Public Library
Cleveland Public Library
Dayton Public Library
Toledo Public Library
OKLAHOMA
Oklahoma County Libraries, Oklahoma City
TENNESSEE
Memphis Public Library
TEXAS
Dallas Public Library
Fort Worth Public Library
WASHINGTON
Seattle Public Library
WISCONSIN
Milwaukee Public Library

An extensive collection of NASA and NASA-sponsored documents and aerospace publications available to the public for reference purposes is maintained by the American Institute of Aeronautics and Astronautics, Technical Information Service, 750 Third Avenue, New York, New York, 10017.

EUROPEAN

An extensive collection of NASA and NASA-sponsored publications is maintained by the British Library Lending Division, Boston Spa, Wetherby, Yorkshire, England. By virtue of arrangements other than with NASA, the British Library Lending Division also has available many of the non-NASA publications cited in *STAR*. European requesters may purchase facsimile copy or microfiche of NASA and NASA-sponsored documents, those identified by both the symbols "#" and "*", from: ESRO/ELDO Space Documentation Service, European Space Research Organization, 114, av. Charles de Gaulle, 92-Neuilly-sur-Seine, France.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
WASHINGTON, D.C. 20546

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

SPECIAL FOURTH CLASS MAIL
Book

POSTAGE AND FEES PAID
NATIONAL AERONAUTICS AND
SPACE ADMINISTRATION
NASA-451

U.S.MAIL

POSTMASTER: If Undeliverable (Section 158 Postal Manual) Do Not Return

NASA CONTINUING BIBLIOGRAPHY SERIES

NUMBER	TITLE	FREQUENCY
NASA SP-7011	AEROSPACE MEDICINE AND BIOLOGY Aviation medicine, space medicine, and space biology	Monthly
NASA SP-7037	AERONAUTICAL ENGINEERING Engineering, design, and operation of aircraft and aircraft components	Monthly
NASA SP-7039	NASA PATENT ABSTRACTS BIBLIOGRAPHY NASA patents and applications for patent	Semiannually
NASA SP-7041	EARTH RESOURCES Remote sensing of earth resources by aircraft and spacecraft	Quarterly
NASA SP-7043	ENERGY Energy sources, solar energy, energy conversion, transport, and storage	Quarterly
NASA SP-7500	MANAGEMENT Program, contract, and personnel management, and management techniques	Annually

Details on the availability of these publications may be obtained from:

SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Washington, D.C. 20546